

BUILD A FOREST on a bluff, STEP BY STEP



Model Railroader®

**Brawny Athearn
SD60M reviewed**

October 2008 • www.ModelRailroader.com

SPECIAL TRACK SECTION

How to model main lines, sidings, and spurs

PLUS 3 more track how-to projects

Install a DCC sound decoder

HOW TO

- Build an N scale structure with odd corner angles
- Kitbash an SD10 diesel
- Operate your trains like the prototype

Author Paul Dolkos shows you how to model different types of track. See page 38

LANDMARK LAYOUT:
Bob Hayden's scenic Carrabasset & Dead River Ry.



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www.atlasrr.com/HOLoco/hogp40-2.htm



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HO & N 1932 ARA BOX CAR

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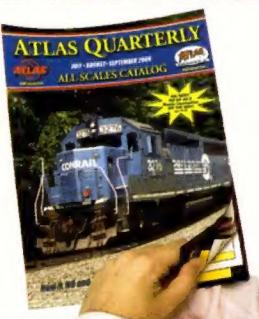
- Murphy Panel or 11 panel flat riveted roof as appropriate per road name
- 4/4 Dreadnaught or flat, riveted ends as appropriate per road name

Check out these Paint Schemes!

- Central of Georgia, Clinchfield*, Missouri Pacific (I-GN), Maine Central, Warrior River Terminal

See what else is available this month from Atlas in the latest edition of the **ATLAS QUARTERLY**!

THE NEW ATLAS QUARTERLY ALL SCALES CATALOG



Welcome to the Atlas Quarterly All Scales Catalog. This catalog is the most comprehensive source for all Atlas products introduced throughout the year. It is a resource designed to provide distributors, hobby stores and you, the end customer, with up to date access for the ever changing product lines in every major Atlas scale, (N, HO and O) during the four quarters of every year.

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- Product announcements available for pre-order
- Product arrivals available in your local hobby store
- Atlas track and accessory order forms
- Atlas all scales international hobby store listing

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TT/DTTX

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GM, PRR, NYC, UP, ATSF

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- New!** • **GP7/9** \$72.99

(With Decoder \$98.49)

- **MRL, GN, PC, RI, NYC, DRGW, SP, UP**

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- Operate your trains like the prototype

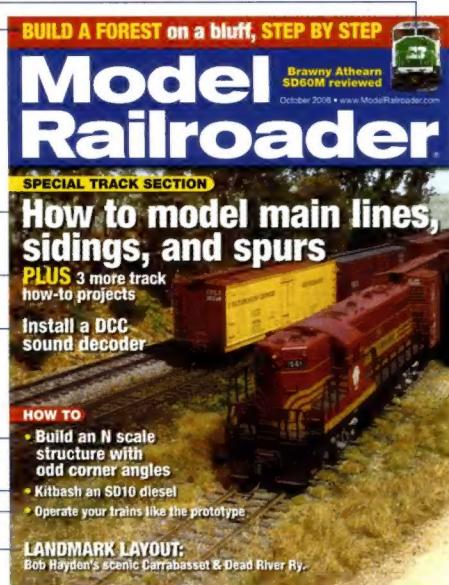
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Bob Hayden's scenic Carrabasset & Dead River Ry.

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Coming next issue: Ever finish a layout? Daryl Kruse has. Next month we visit his completed N scale Union Pacific Rochelle Subdivision.

“I’m *smiling* because this passenger car
will soon be available in N scale!”



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From the Editor

Naming a railroad

Neil Besougloff, Editor



Back in the spring, I wrote in this column about my son's N scale layout, the Generic & Vague RR. Its loose name tells you that my son and I were wishy-washy on the details of its Western theme.

Dennis Murphy, an avid *Model Railroader* reader, recently wrote me about that column and about how people name their railroads. Dennis' layout doesn't have a traditional name; he just calls his layout "Train World." (Yes, Dennis knows that there is train store with the same name.)

Dennis' comments about how people name their railroads got me to thinking about the layout names and nicknames we use here at *Model Railroader*.

Our freelanced staff club layout is the Milwaukee, Racine & Troy RR or MR&T, but we just call it "The Myrt" although we have to be mindful of this nickname. More than once we have referred to "Myrt" in front of visitors, who might easily think they are about to meet someone named Myrtle.

Adjacent to The Myrt is last winter's *Model Railroader* project layout, the Wisconsin & Southern Troy Branch. We call it the "Wisor" after the railroad's WSOR reporting marks, but we have to be careful about that nickname, too.

At home, senior editor Jim Hediger's layouts have always been the Ohio Southern RR and managing editor David Popp's New Haven RR layout is the

Naugatuck Valley RR. Both names reflect the places they model.

There was a time when David wasn't as prototypical. He and his dad once built a mining railroad called the Bankruptcy & Receiver.

We refer to executive editor Andy Sperandeo's Santa Fe Cajon Pass layout as "Andy's layout." Two words are easier than four.

Some of the layouts don't have names. Staff editor Kent Johnson models the Canadian Pacific in British Columbia. I asked him what he called his layout, and he smiled and meekly said "ah, Kent Johnson's layout."

Naming your railroad is an individual choice. Sometimes it's easy and the name sticks, like Jim's long-lived Ohio Southern, sometimes the prototype you are modeling does it for you, as in Andy's case, and sometimes it's hard, as with Kent's British Columbia layout. But choosing a name does help give your model railroad a focus, a purpose, and a direction, something my son's Generic & Vague RR was originally lacking.

As Dennis wrote in his letter, "By giving your train layout a name you will have a direction to follow. But what if you find you don't much like that direction? Who cares! Just make a new name and go from there."

NEIL BESOUGLOFF

Contributing to *Model Railroader*

We welcome contributions from our readers, including articles, photographs, and prototype drawings. For detailed information on submitting material to MR, contact our editorial associate Eric Stelpflug at 262-796-8776, ext. 583, or mrmag@mrmag.com. *Model Railroader* assumes no responsibility for the safe return of unsolicited material. We assume unsolicited material is intended for publication by Kalmbach Publishing Co. unless otherwise noted. We assume letters, questions, news releases, and club news items are contributed gratis.

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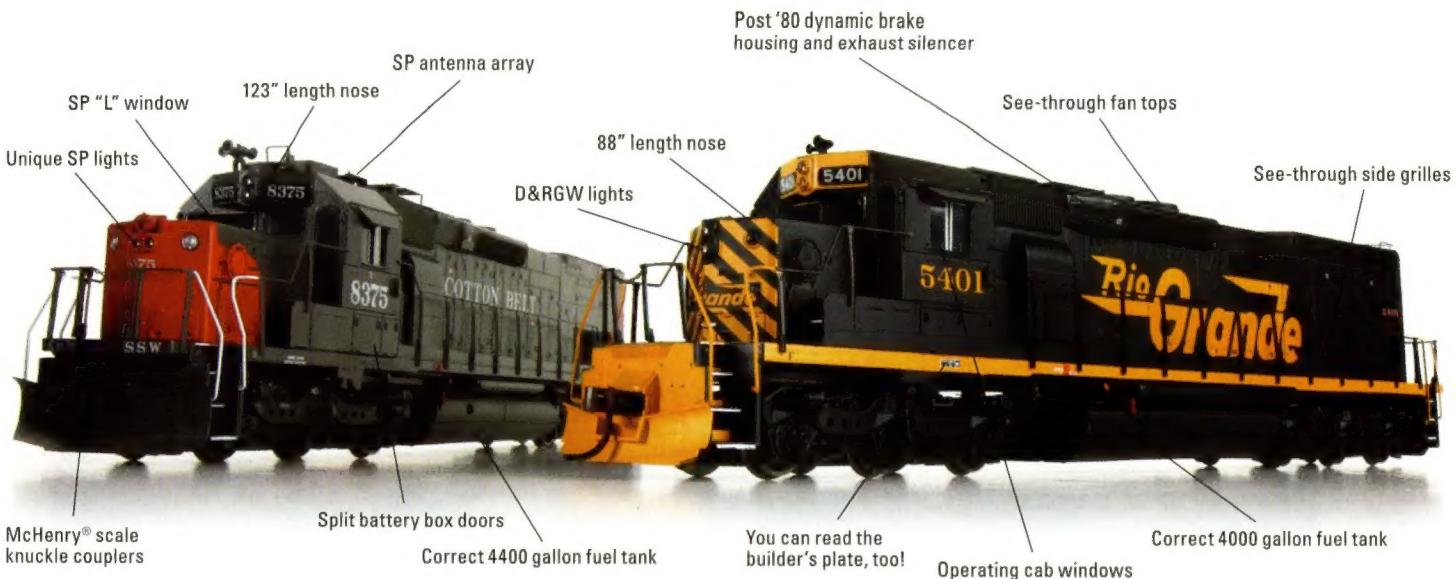
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 95120 KCS #6101, 123" nose
 95121 KCS #6102, 88" nose
 95122 KCS #6106, 123" nose

HO SD40T-2, MSRP \$99.98

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 95124* Southern Pacific #8351 116" nose
 95125* Southern Pacific #8353 116" nose
 95126* SSW Cotton Belt #8375 123" nose
 95127* SSW Cotton Belt #8323 123" nose
 95128* SSW Cotton Belt #8373 123" nose

News & Products

National
Train Show
special!



Model train fans check out modular railroad displays and the booths of manufacturers and vendors at the 2008 National Train Show in Anaheim, Calif. The show,

held in conjunction with the National Model Railroad Association's national convention, brought thousands of hobbyists to the Anaheim Convention Center.

Small scales are big story at Anaheim

At the National Train Show in Anaheim, Calif., in July, the biggest buzz was all about the smallest scales.

Steam-era N scale modelers can look forward to a Southern Pacific Cab-Forward from InterMountain

Railway Co. (see page 12) and a class Y3 2-8-8-2 Mallet by Wm. K. Walthers Inc. As for diesels, Kato USA plans a run of Electro-Motive Division SD70ACe's in Union Pacific heritage schemes, and Atlas is unveiling an EMD GP15-1. Athearn, Rapido Trains, Micro-Trains Line Co., Wheels of Time, TrainCat Model Sales, DeLuxe Innovations,

and others also expanded N modelers' rolling stock options.

In Z scale, Aspen Model Inc. showed off its new all-brass Ten-Wheeler, while Micro-Trains Line Co. unveiled a preproduction model of its EMD SD40-2 diesel. (See pages 11 and 14, respectively.)

For the big picture, see our show report at ModelRailroader.com.

► Highlighted in this issue

10 Athearn HO Union Pacific gas-turbine locomotive

10 HO Electro-Motive Division GP40-2 diesel from Atlas

11 1:20.3-proportion wood caboose by Bachmann

12 Wm. K. Walthers Inc. HO Fairbanks-Morse H-10-44

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Rapido Trains entering N scale market

Rapido Trains, a manufacturer of passenger cars, train sets, and accessories in HO scale, is jumping into the N scale game with its "Panorama Line" of passenger cars.

The first cars in the series, a lightweight coach and a deluxe sleeper, will be offered decorated for Amtrak, Canadian National, Great Northern, New York Central, Pennsylvania, Southern Pacific, Union Pacific, and a half-dozen

more railroads, as well as undecorated. They will feature detailed underbodies and interiors, diaphragms with etched-brass gates, and scale metal wheelsets. The cars sell for \$47.95 each and will be available in early 2009.

The company is also offering both its "Easy-Peasy" battery-powered car interior lighting sets and two varieties of passenger-car trucks in N scale.

Athearn announces commemorative products for MR's 75th anniversary

Two HO scale diesel locomotives, a hopper car, a gondola, and a delivery truck in both HO and N scales are being offered by Athearn Trains to commemorate *Model Railroader* magazine's 75th anniversary. The models will be decorated for the Milwaukee, Racine & Troy, the magazine's freelanced HO scale club layout.

Athearn is offering an Electro-Motive Division SD40-2 locomotive decorated in dark blue livery, with the MR&T herald and *Model Railroader*'s 75th anniversary logo. The HO scale direct-current engine, which is equipped with a five-pole skew-wound motor with flywheels, acetal handrails, and McHenry magnetic knuckle couplers, will sell for \$99.98.

Also being offered in HO scale is a Santa Fe-rebuilt CF7 diesel decorated for the Troy & Northern, a former freelanced branch line of the MR&T layout. (A series of articles on converting the former Troy & Northern into the Wisconsin & Southern was published in MR's January-April 2008 issues.) The Troy & Northern CF7 is painted in a Milwaukee Road-like gray-and-orange paint scheme and carries a retail price of \$89.98.

Two freight cars decorated for the MR&T will also be available. The two-bay rib-side covered hopper sells for \$24.98 in HO scale and \$19.98 in N. An HO 65-foot mill gondola will cost \$19.98; the N version will sell for \$15.98. The HO scale cars will feature metal wheelsets; both have McHenry scale magnetic knuckle couplers.

The final item is a box van, also bearing the MR&T herald. The HO scale Ford F-850 truck will sell for \$19.98; the N scale version, a Ford "C" cab-over model, costs \$12.98.

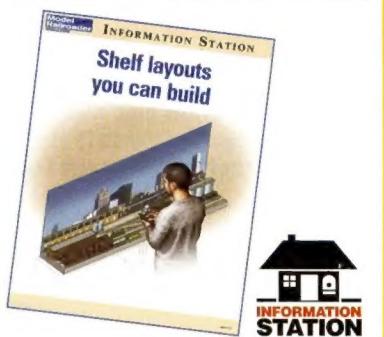
Athearn says the models will be available in winter 2008.

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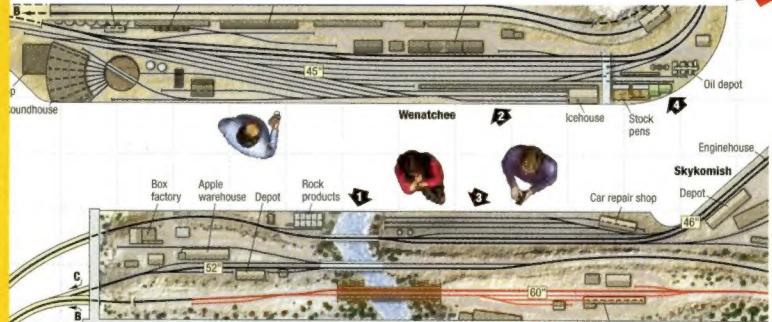
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HO scale General Electric 4,500-hp gas-electric turbine locomotive with fuel tender.

Athearn Trains' biggest announcement at this year's National Train Show was this preproduction model of a Union Pacific-prototype first-generation gas-turbine locomotive. When the Genesis Series

locomotive is available in early 2009, it will come as a direct-current model or with Digital Command Control and sound. Prices for the ready-to-run model are yet to be announced.



HO scale Electro-Motive Division GP40-2 diesel locomotive. Atlas Model Railroad Co. kept the production of this Master Line model under wraps until the National Train Show opened on July 18. In addition to the Chessie System model shown, the locomotive will come decorated in six other road names. It will be available either as a direct-current model or with Digital Command Control and QSI sound. The DC version will come with an 8-pin DCC plug and cost \$149.95; with DCC and sound, the locomotive will sell for \$239.95.



HO scale New York Central 4-8-2 Mohawk steam locomotive.

MTH Electric Trains took the wraps off its newest steam locomotive at Anaheim. The model, equipped with Digital Command Control and MTH's own Digital Command System, comes with a sound system and smoke generator synchronized to the wheel rotation. It has a five-pole skew-wound motor with dual flywheels and is available in multiple versions. The ready-to-run locomotive sells for \$449.95.

HO scale locomotives

General Electric 45-tonner diesel switch engine. Bethlehem Steel (yellow and black), plus four unlettered paint schemes: yellow with black safety stripes, black, red, and green. Digital Command Control, die-cast metal body shell, and E-Z Mate II magnetic knuckle couplers. Price to be announced. Spring 2009. Ready-to-run. Spectrum series. Bachmann

Baldwin VO-1000 diesel locomotive. Bethlehem Steel (Patapsco & Back Rivers RR reporting marks), Great Northern, Lehigh Valley, Pacific Electric (electrified version with trolley poles), Southern Pacific (electrified with trolley poles, one road number), and Western Pacific. Two numbers available per road name unless noted. To be offered as direct-current model or with Digital Command Control and sound. Prices to be announced. Winter 2008. Bowser

Electro-Motive Division MP15DC diesel locomotive. Amtrak; Atchison, Topeka & Santa Fe (silver warbonnet or blue freight scheme); Burlington Northern; Chessie System (Baltimore & Ohio reporting marks); Chicago, Burlington & Quincy; Conrail; Illinois Central; Missouri Pacific; Norfolk Southern; Southern Pacific (bloody nose scheme; speed lettering or Roman lettering); Union Pacific; and Wisconsin Central. Also available undecorated. Dual-mode Digital Command Control decoder, dual flywheels, and Kadee magnetic knuckle couplers. \$99.98. Ready-to-run. Con-Cor International

HO scale passenger cars

Amtrak Superliner passenger cars. Diner, sleeper, coach-baggage, and lounge. Availability dates and prices to be announced. Kato USA

85-foot Pullman Palace passenger cars. Great Northern (*Oriental Limited*), Union Pacific (*Overland Limited*), Pennsylvania (*Broadway Limited*), and Southern (*Crescent Limited*). Combine, diner, sleeper (two numbers available), and observation car. Metal RP-25 contour wheels, wire grab irons and truss rods, and body-mounted McHenry magnetic knuckle couplers. \$24.98. January 2009. Ready-to-run. Roundhouse

HO scale freight cars



Factory-weathered 30-foot narrow gauge wood flatcar.

Denver & Rio Grande Western (four car numbers available) and Rio Grande Southern (one number). Also available painted but unlettered. Archbar trucks, blackened metal wheels, and Kadee no. 714 magnetic knuckle couplers. \$39.95. Fall 2008. Blackstone Models

Pennsylvania RR X26c-type rebuilt United States Railway Administration boxcar.

Youngstown doors and PRR decals, Superior doors and PRR decals, or Youngstown doors and Detroit, Toledo & Ironton decals. One-piece resin body, waterslide decals, and Tichy Train Group details. \$41.99. Add \$6.50 shipping for orders under \$85, \$12 shipping for orders between \$85 and \$150, free shipping for orders over \$150. Pennsylvania residents add 6 percent sales tax. Funaro & Camerlengo



Southern Pacific B-50-2 boxcar with Van Dorn ends. Cast-urethane kit. Includes decals and safety gear (ladders, stirrups, and running

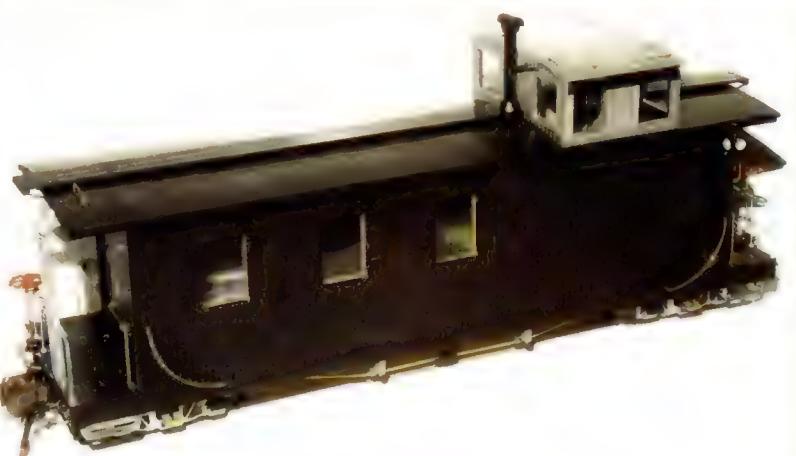
Continued on page 14



Z scale 4-6-0 Ten-Wheeler steam locomotive. Fans of the small scales had plenty to see at the National Train Show, including this old-time brass locomotive from Aspen Model Inc. Available either as a kit or ready-to-run, the model comes with a Faulkner motor and Micro-Trains couplers. The kit version retails for \$213.76, while a painted, ready-to-run model costs \$805.76.



S scale single- and double-door FMC boxcars. Des Plaines Hobbies unveiled these 50-foot steel boxcars at Anaheim. Pictured are a Toledo, Peoria & Western 5,347-cubic-foot-capacity single-door boxcar, at left, and a Cotton Belt 5,283-cubic-foot-capacity double-door boxcar. Both are available in multiple road names, with four car numbers apiece. The ready-to-run cars come with American Flyer-compatible wheels and couplers and retail for \$44.98 each.



1:20.3-proportion Rio Grande caboose. Bachmann unveiled this preproduction prototype of a large-scale wood caboose with detailed interior and working marker lights. The model will be available in November, decorated for the Denver & Rio Grande Western, Rio Grande Southern (with round herald or "Flying Grande" lettering), and painted but unlettered (oxide brown or oxide red). The ready-to-run caboose, part of Bachmann's Spectrum line, will sell for \$275.

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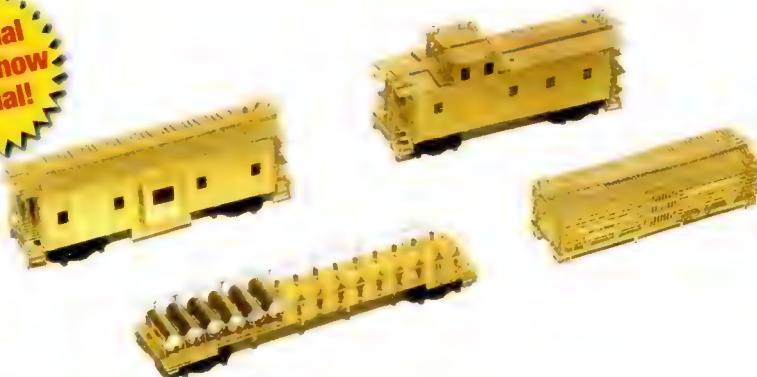
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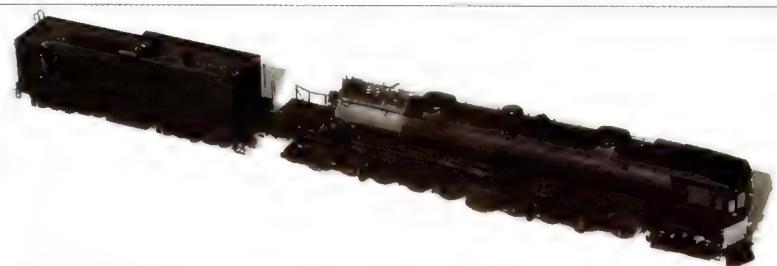
National
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Brass N scale car kits. TrainCat Model Sales expanded its line of rolling stock kits with these announcements: a Southern Pacific C-30-6 type bay-window caboose, \$46.50; a Southern Pacific C-40-3 type cupola caboose, \$44.50; an American Car & Foundry chlorine tank flatcar, \$34.95; and a Denver & Rio Grande Western narrow gauge stockcar, \$38.50. Trucks and couplers are not included.



HO scale Fairbanks-Morse H-10-44 diesel locomotive. Wm. K. Walthers Inc. showed off its new model of Fairbanks-Morse's well-known yard switcher. The Proto 2000 model is available decorated for eight railroads, including the Chicago & North Western model seen here, plus undecorated. It's powered by a five-pole skew-wound motor with flywheels and is available as a direct-current model for \$129.98 or with DCC and QSI sound for \$229.98.



N scale Southern Pacific AC-12 steam locomotive. Inter-Mountain Railway Co. exhibited a preproduction model of its new N scale AC-12 Cab-Forward locomotive at the National Train Show. The model will be available this fall in four road numbers, plus painted but unlettered. The ready-to-run model will sell for \$329.95.

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Z scale Electro-Motive Division

SD40-2 diesel locomotive. Micro-Trains Line Co. showed off a preproduction model of its latest Z scale diesel at Anaheim. Though road names and price were yet to be announced, Micro-Trains said the locomotive will come with a Maxon coreless motor with dual flywheels, separate handrails, and Magne-Matic magnetic knuckle couplers. The first versions of the ready-to-run model will be available in early 2009.



86-foot wood Howe truss bridges.

These wood craftsman kits with phosphor-bronze bracing wires and cast-plastic detail parts are the latest offering from Hunterline. To complement Hunterline's previously offered HO scale version, these through-truss bridge kits are now being offered in S scale (shown, also suitable for On2½) for \$110, O scale (\$150) and N scale (\$55).



HO scale Southern Pacific 2-6-0 Mogul steam locomotive.

Sunset Models rolled out another HO scale brass locomotive with this ready-to-run engine. The model comes with Digital Command Control and QSI sound, a five-pole skew-wound motor with flywheels, and Kadee magnetic knuckle couplers. It sells for \$699.95.

Continued from page 11

boards) for both as-built and post-refit styles. Trucks and couplers not included. \$35. Westerfield

HO scale structures

Orange Vista Packing House.

Die-cut mat board kit. One-piece roof. Price to be announced. Alpine Division Scale Models

Witzinger's Washboards. Laser-cut wood kit. Full-color signs, Tichy Train Group window castings, and laser-cut roofing material. \$49.95. Bar Mills Scale Model Works



Rail shops styrene structure kits. Railroad shops (shown), modular design, \$69.98. Engineering office, \$44.98. Car shop, \$47.98. Assembled and wired transfer table, \$329.98. Wm. K. Walthers Inc.

HO scale details & accessories

Kenworth work trucks. Tow truck, six paint schemes, \$24.98; cement mixer, five schemes, \$23.98; and dump truck, six schemes, \$23.98. Positionable details, full window glazing, and rolling vinyl tires. Athearn Trains

Assorted HO scale diesel detail parts. Late-era diesel speed recorder with cable, cast pewter, price to be announced. Window sun shade with tracks, etched brass, price TBA. Rear light cluster set for Southern Pacific Electro-Motive Division diesels, pewter, \$2.99. Snowplow for Southern Pacific General Electric locomotives, pewter, price TBA. Nathan P5 air horn, brass, price TBA. Details West

N scale train sets

Union Pacific M-10000 three-car train set.

Union Pacific (brown and yellow) or painted silver but unlettered. Detailed and lighted interiors, eight-pin Digital Command Control plug, and reversing head and tail lights. Three-car set, \$429.98; additional Pullman coach (two car names available), \$139.98. Fall 2008. Ready-to-run. Con-Cor International

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Electro-Motive Division
SD70ACe diesel locomotive. Chicago & North Western, Denver & Rio Grande Western, Missouri-Kansas-Texas, Missouri

Pacific, Southern Pacific, Union Pacific, and Western Pacific. Price to be announced. Kato USA Inc.

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O scale locomotives

United States Railroad Administration 0-6-0 steam locomotive.

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Z scale details and accessories

Mining and construction equipment.

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Large scale details and accessories

Radio-controlled remote uncoupling system.

Handheld remote operates couplers and track turnouts. Price and availability date to be announced. Kadee Quality Products Co.

Multiple-scale freight cars

Norfolk Southern TopGon coal hopper.

HO and N scale. Injection-molded plastic. Road names and price to be announced. Early 2009. BLMA Models

Electronics and controls

AirWire Linker and Activator
wireless Digital Command Control accessory decoder components.
Stand-alone controllers designed for use with company's AirWire wireless Digital Command Control throttles. Linker unit receives

commands from throttles and sends them to up to 99 Activator modules, which can control up to four turnouts, lights, or other accessories each. Battery powered; pulse, continuous, or combination outputs. Linker: \$199. Activator: \$119 in enclosure, \$99 for circuit board only. CVP Products

ECoS Control Radio Digital Command Control throttle.

Wireless cab for ECoS DCC system. Two-way 2.4GHz radio communication, liquid crystal digital display, thumb joystick, ability to control up to 100 locomotives. Price to be announced. Fall 2008. ESU LLC

Prodigy computer interface.

Allows modeler to run an MRC Prodigy-controlled layout from a Windows-based personal computer. Wireless interface; works with all NMRA-compatible Digital Command Control decoders. Price to be announced. Fall/winter 2008. Model Rectifier Corp.



TSU-1000 Tsunami Digital Command Control sound decoder. For HO scale locomotives powered by first-generation Electro-Motive Division 567 diesel engines. Back-electro-motive-force (EMF) control, 1-amp stall current, 16 air horns, and 14 sound effects. \$119. SoundTraxx

CN-GP Digital Command

Control decoders. For older N scale Electro-Motive Division GP series locomotives. Split-board design. Eight-pin plug and directional golden-white light-emitting-diode lighting. \$38.95. Train Control Systems

Software

Software update for Lenz Digital Command Control systems. Version 3.6 update for LZV, LH90 and LH100 systems will add programming ability for functions F0 through F28, allow reading configuration variables (CVs) on the main, improve database support, and add other functions. Availability date, price, and terms to be announced. Lenz Agency of North America

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Oversize loads require special handling that can add some interesting variety and realistic problems to your operating session. Jim Forbes photo

Special loads

I enjoyed the article on adapting flatcars for super-sized loads, and I thought I'd share some memories from several years ago when the power company I work for had to ship a transformer back to the factory for a rebuilding project.

We used a heavy duty FD-class flatcar, and it took about 10 workdays for a team of three welders and four helpers to make the necessary adaptations to fit the transformer. There were divots from previous loads that had to be altered, trimmed, or ground flat, and then we installed the mounting rig for our transformer.

When the transformer came back, it was on the same car. After we'd unloaded it, the last job the welding team did was to cut off the fittings they'd installed and knock the welds down to about $\frac{1}{2}$ " tall, making things easier for the next crew. It might be fun to try to model these previous load "scars" on the deck of one of these cars.

Mike Bell
Colstrip, Mont.

Meeting of the trains

I look forward to every issue of *Model Railroader* for both information and entertainment value. Tony Koester's Trains of Thought column is one of the features I read.

His article "Number 47 is by Cayuga" in the August issue didn't disappoint. It was interesting, informative, and fun to read. I did have one question, though.

Since No. 47 and No. 42 were scheduled second class trains, wouldn't it have been better practice for a scheduled meet to appear in the timetable, delaying 47's scheduled

departure time from Cayuga until after 42 was in the clear?

Les Beckett
Selma, N.C.

[Hi, Les! Good to hear from you, and thanks for the kind words.

When a meet was shown in the Nickel Plate timetable, that was simply an advisory and not a "hard meet." The superior train could keep hammering along if the inferior train had not shown up at the meeting point. Retired Nickel Plate engineer Don Daily told me that NKP practice was to help late trains (usually westbounds) by putting eastbound trains in the hole for them via train orders.

Bottom line: The timetable schedule required 47 to wait in the siding at Cayuga for 42, as 47 was on 42's time when it left Cayuga. Apparently, the crew overlooked that fact and proceeded, but I doubt they'll do so again! – Tony Koester]

A simple thanks

Thank you for the fine story and pictures of my Pennsy steam layout in the August issue. Credit for the fine detailing and weathering done on some of my locomotives pictured should be given to my friend Bob Malberti of Wayne, N.J. Bob has won numerous local and national awards for his excellent detailing and weathering of engines.

Glenn Nilsen
Jackson, N.J.

A new track plan

I've been revisiting and enjoying Steven Otte's article "Three track plans for one sheet of plywood," in the August 2008 MR. I appreciate that MR includes ideas for small

layouts on a regular basis. I especially enjoy the Indiana & Aurora RR track plan. I've built three small layouts but never thought of a way to design a true point-to-point operating scheme.

The I & A represents a significant design advancement for small layouts. On one sheet of plywood it cleverly includes a staging yard, point-to-point operation, a continuous run option, shallow profile industries, lots of switching opportunities, and a passing siding.

As Jim Hediger said on page 27, "Most of our track planning articles are offered as idea generators to get readers thinking . . ." The I & A track plan has certainly taken my thinking to new directions.

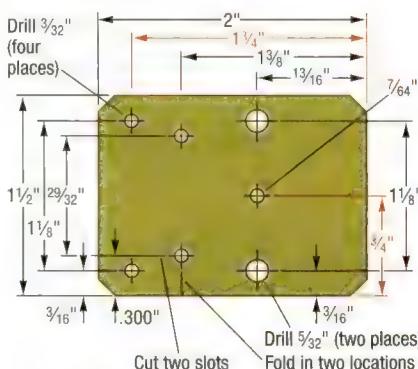
Drew Cannon
Indianola, Iowa

Corrections

Jack Spedden's trolley models pictured on page 45 in September's issue of *Model Railroader* are HO scale models and not O scale as indicated by the photo caption.

The drilling template for Thomas Hillebrant's turnout bracket on page 68 of the September issue contained two mislabeled pointer stops. The error was introduced by the MR staff and not the fault of the author. The corrections are shown below in red. – Ed.

Drilling template



Comments, suggestions, and additional information on MR articles and departments are welcome in this column. Every comment will be read, but not all can be printed or answered. Make your statement in 300 words or less, and send it to Railway Post Office, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail rpo@mrmag.com. Please include your name, city, and state.

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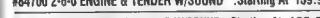
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Gradall's railroad track maintenance machine is a hydraulic excavator that uses a variety of interchangeable tools. It includes rubber tires and railroad wheels so it can travel on a highway or work from the track. Bob Warrick photos



Here's the business end of a huge weed whacker that clears brush growing within 25 feet of the track.

Industrial size weed whacker clears brush

Summer is the busy season for railroad maintenance crews who only have a few months to handle heavy track repairs, clear brush from the right of way, and open up and restore all of the drainage ditches. The strange-looking track machine shown here is one of their primary tools.

Gradall is the trademark name for a versatile series of hydraulic excavating machines that were developed during World War II. At the time, manpower was in short supply and construction was booming. Railroads soon found that these compact earth-moving machines could be fitted with railroad wheels and many other

attachments to expand their capabilities. Rubber tires allow highway travel to a grade crossing near the job site. There the machine can shift to its railroad wheels and travel along the track for easy access to remote areas.

From its on-track position, this Gradall's cab can rotate from side to side and its triangular boom can reach more than 20 feet in the air over a 25-foot radius. When it's fitted with a bucket, it can clear debris from ditches down to 18 feet below the rails, yet its compact size allows it to work in tight spots under bridges and inside tunnels.

The Gradall shown here is fitted with a mowing attachment that

operates just like a huge string trimmer. The large steel disk rotates at high speed and the three swinging steel blades cut off any tall grass, weeds, or underbrush.

Besides the mower, Gradall offers interchangeable boom extensions, special purpose buckets, a grapple, and tree limb shears.

Whenever this machine's work will interfere with a main track, the maintenance foreman must get a "track and time" authorization from the train dispatcher that specifies when the work can be done. The operating rules require that the machine must be clear of the track before the time expires. — *Jim Hediger, senior editor*

In union stations, would one railroad take care of switching services and maintenance, or would the tenants share the work?
Russell Fiero, Farmingdale, N.Y.

A union station is a train depot that's shared by two or more railroads. The idea was to consolidate all of a city's service into a single terminal where passengers could easily make connections between the railroads. The operating costs were shared in a variety of ways, depending upon the organization of the terminal.

Large union stations were often run by a terminal railroad that did all of the switching and property maintenance. The tenant railroads

were charged an annual rental that was based on their traffic and for any servicing they received.

Smaller union stations were often run as a separate, but jointly owned, terminal company. The tenant railroads shared the depot's maintenance costs and profits based on the percentage of stock owned. Each owner took care of its own switching, car maintenance, and locomotive servicing. Mail and express services were handled under separate contracts.

For more information, I recommend Andy Sperandeo's book, *The Model Railroader's Guide to Passenger Equipment & Operation* (Kalmbach). — *J.D.H.*

I've noticed that the Union Pacific's signals only light up when there's a train approaching nearby. Is there any way to model this?

Nick Schumacher, Carroll, Iowa

This style of signal operation is known as approach lighting. With this system, signals are normally dark. When a train enters the approach block, it energizes a relay to turn the signal on so the oncoming engine crew can see its indication. After the train passes, the signal turns off.

Approach lighting is common in today's signal systems as it conserves energy and reduces potential vandalism in rural areas. Lighted

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Information Desk

railroad signals have always been popular targets for bored hunters. Leaving the lamps off takes away the satisfaction of a good shot.

Most of today's more advanced model railroad signal systems offer optional electronic circuitry that will reproduce this effect, if desired. — *J.D.H.*

I purchased a number of HO scale intermodal containers in all of the contemporary sizes and then bought a group of A-Line, Athearn, and Walthers well cars to haul them. My problem is none of the well cars can handle the 53-foot containers, so I'm wondering if I missed a specialized extra long well car that hauls them?

Paul Caiazza, Bradford, Mass.

Gunderson makes the prototype Husky Stack well cars. Athearn offers HO scale 56-foot 2+2 cars and several five-platform versions in numerous paint schemes. Kato offers the Maxi-IV three-platform cars with 53-foot wells in HO.

National Steel Car Co. (NSC) is a Canadian car builder that makes high-capacity intermodal cars with 53-foot wells. HO models of these cars are sold by Walthers in three-platform or single-unit cars.

Intermodal containers are built with all of their strength in the floor and end frames, but the rest of the box is relatively weak sheet metal. The end frames are the key to supporting a great deal of weight when the containers are stacked in a ship's hold.

However, as long as the stacking frames line up, most 53-foot containers can ride on top of 45- or 48-foot containers.

Some of the heaviest intermodal loads travel in 20-foot containers, so they normally ride in the wells. A long container (40- or 45-foot) may be stacked on top as long as their combined load doesn't exceed the well car's capacity. This weight issue explains why we often see two short containers riding by themselves. — *J.D.H.*

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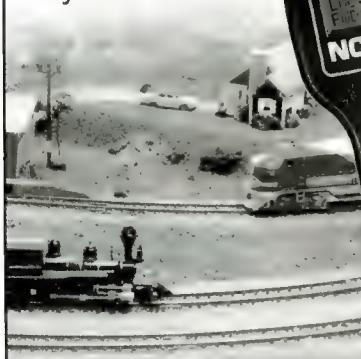
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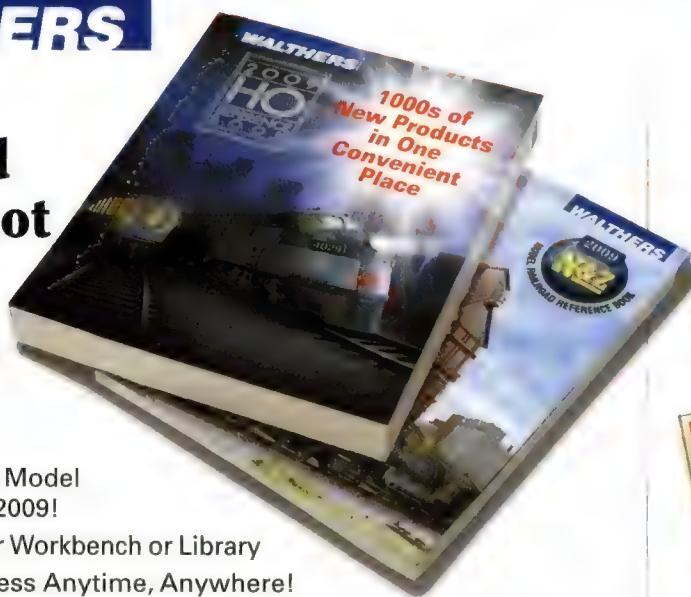
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Bob Foltz builds large structures on a piece of plywood that he sets on a wood stool alongside his workbench. With the plywood balanced on the stool, he can easily turn the model to add details to any side. Bob Foltz photos

Putting a spin on large modeling projects

I was scratchbuilding a large HO scale model of the Las Vegas Harvey House when I decided there had to be an easier way to handle this sizeable, partly finished structure. I didn't have any plans, so many of the dimensions had to be estimated from a mock-up, prototype photos, and sketches. Eventually, the building outgrew my workbench and, to make matters worse, many of its subassemblies were rather delicate until they were installed.

Inspiration hit when I saw a television promotion for a cooking show where the hostess was frosting a cake. She was decorating all sides of the cake by rotating it on a lazy Susan – and she never had to touch the cake. This immediately got me thinking about how I could adapt this concept to my modeling.

I soon found out that the readily available kitchen products were too small, as my hotel filled most of a 30" x 36" footprint. I did have a piece of scrap plywood that was the right size, but how could I make it rotate? The solution came when I temporarily set the plywood on a wooden stool and discovered the

smooth sheet of plywood rotated easily on the flat varnished top.

The stool is a little taller than my workbench, so I could position it with the plywood overlapping the back part of the benchtop. This allowed me to easily reach the model from the office chair (on casters) that I use at the workbench. I could move readily from the in-progress model to my work surface and back again as I measured and test fitted various pieces. The extra space around the model came in handy as a place to temporarily set my scale rule, adhesives, pencil, and small tools.



Small turntables, like this one from Rubbermaid, make it easy to turn models on your workbench as details are added during final assembly.

I didn't attach the plywood panel to the stool and had no problem with the board tipping as long as I didn't lean on it too heavily and kept the weight evenly balanced. For more security, you could drill a hole in the center of the plywood and loosely drive a screw into the stool's top. When your project is finished, simply remove the screw and the stool is still usable for its original purpose.

When I was ready to install the hotel on the railroad, I just picked up the plywood and carried it and the model to the site I had chosen. I set the plywood panel directly on the layout so I only had to lift and move the structure a foot or so into its final location.

After using my homemade turntable, I realized how handy a smaller version would be. Rubbermaid makes plastic turntables 10½" and 14" in diameter that are sold in the housewares department of most large chain stores. I found them ideal for many final assembly jobs.

Having a couple of these inexpensive turntables on hand makes it easier to safely move partially completed models out of the way

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and into temporary storage. They're also handy in my spray booth. I use them to turn the model without touching it to get good paint coverage on all sides. – *Bob Foltz, Colorado Springs, Colo.*

I have a bunch of Walthers HO scale heavyweight passenger cars that need to have a number of holes drilled to install their grab irons and other wire details. I generally buy the no. 80 bits a dozen at a time and seem to use about a dozen per car! Any ideas? *Gary Schmidt, Cleveland, Ohio*

After having a similar experience, I recently tried what sounds like a screwball idea, but found it worked really well. I clamp my Micro-Mark modeler's drill press near the edge of the workbench and put a no. 80 bit in the chuck. Then I use a Dremel speed control to slow the machine's speed way down. A bright floodlight and an Optivisor or magnifying shop light help me see what's happening.

I use a scribe to deepen each of the molded Walthers drilling points and then I hold the carbody in both hands, with the heels of my hands resting on the bench.

Next, I gently lift the carbody up into the spinning drill bit until the bit contacts the mark and begins to cut into the plastic. I maintain light pressure until I feel the bit break through. At that point, the weight of the carbody will allow it to back off the spinning bit. Note that the carbody orientation must be maintained as each hole is drilled or the bit will be damaged.

This method also lets me drill holes at an angle into the curved surfaces of the roof.

Between holes, I run the bit into a bar of soap for lubrication.

Since I started this method, I haven't broken more than a couple of bits drilling holes in my plastic cars. – *Jim Hediger, senior editor*

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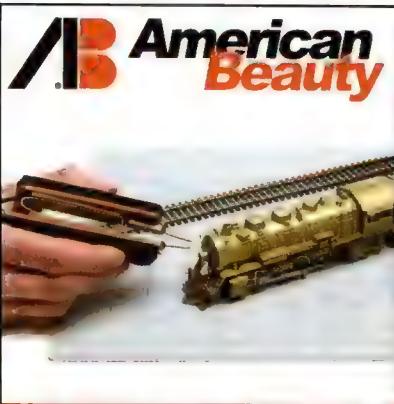
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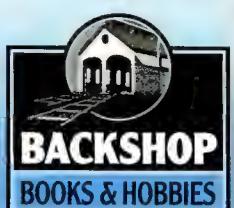
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Follow along as Cody Grivno tells you how he completed the scenery on this bluff. Photos by the author and Jim Forbes

Model the edge of a forest on a bluff

In the August Scenery Step by Step column, Neil Besougloff and I installed plaster rocks at Winter Hill on our HO scale Milwaukee, Racine & Troy layout. This month, I'll continue upgrading the scenery at this location by adding trees.

Trees are available in dozens of species from a variety of manufacturers, so finding ones appropriate for the locale of your model railroad isn't that difficult. For this project, I used coniferous trees from Grand Central Gems, Scenic

Express, and Timberline Scenery Co. These firms produce coniferous trees similar to those found in southeastern Wisconsin, where our layout is set.

Also, these are the same trees David Popp used for the Lake Beulah makeover (February 2007 *Model Railroader*). Lake Beulah is on the other side of the layout aisle from Winter Hill. From certain angles, Lake Beulah and Winter Hill can be viewed as one scene, so I wanted to tie these two wooded areas together.

Though the trees used here are ready to plant, I enhanced those in the foreground by adding roots, as shown in **step 2**. For more tips on upgrading trees, read my article "Improving commercial trees" in the June 2007 issue of *MR*.

There are few parts of the country that don't have wooded areas, so trees are a necessity for your model railroad. Fortunately, we have a variety of model trees to pick from. Find those that look right for your area and get planting. **MR**

Step 1 Preparing the scene



Dried up lichen, faded ground foam, and clump foliage was the scenery at Winter Hill when I started this project. The scenic base for this portion of the layout is a cardboard web covered with plaster-impregnated gauze strips. Since I knew removing the ground foam with a putty knife could potentially damage the fragile scenic base, I removed only the lichen and clump foliage and left the ground foam in place. I used a vacuum to suck up any loose scenery.

Next, I applied diluted white glue (4 parts white glue to 1 part water) over the scene with a foam brush. Then I used a spoon to apply Timberline Scenery Co.'s forest floor ground cover. The color of the foam was a bit too vibrant for my taste, so I toned it down by sprinkling Woodland Scenics green blend fine turf and Scenic Express coarse green grass over it.

Step 1 Preparing the scene (cont'd)

Once I had the scenery material in place, I wet it with 70 percent isopropyl alcohol. After letting the alcohol soak in for a couple of minutes, I used a pipette to apply Woodland Scenics Scenic Cement, as shown in the upper right photo. Applying the alcohol first makes it easier for the Scenic Cement to wick all the way through the ground foam. Otherwise, the top layer will dry hard, and the scenery underneath will be loose.

With the Scenic Cement still wet, I used a Noch Gras-Master to apply static grass (fibers that, when used with the Gras-Master, stand vertically). I first applied ochre field grass fibers, but they looked too pale. Then I mixed in golden-yellow field grass (1:1 ratio) to create the blend shown in the lower right photo. The static grass, when used with ground foam, gives the forest floor more depth and realism.



Step 2 Foreground trees

I used Grand Central Gems hand-made lodgepole pines for the foreground trees. However, instead of simply sticking the trees in the ground, I added roots to those that would be close to the rock outcropping.

To do this, I first used a $\frac{3}{32}$ " bit to drill holes near the base of each tree. Next, I clipped off branches from metal Woodland Scenics tree armatures and inserted them in the holes. I used medium-viscosity cyanoacrylate adhesive (CA) to cement the metal branches, now used as roots, to each tree. See the upper right photo.

Next, I applied Tamiya modeling putty to blend the roots into the trees. I spread the air-dry material with a Squadron Products putty applicator, shown in the second photo at right. This tool makes it easy to blend the putty into the wood tree trunks.

I let the putty dry overnight, and then I lightly dragged a razor saw over it to create a bark texture, blending the putty into the trunk.

I airbrushed the puttied area and roots with Polly Scale Earth, followed by a thin coat of Steam Power Black (1 part paint to 9 parts 70 percent isopropyl alcohol). I painted a bit of the tree trunks, too, completing the transition between the wood tree trunks and the putty. You can see the results in the third photo on the right.

Finally, I planted the foreground trees on the rocky outcropping. I used smooth-jaw needle-nose pliers to carefully bend the roots. Unfortunately, the putty cracked a bit when I did this. I used gap-filling CA to fill the cracks, and I touched up the area with paint. Once I'd bent the roots to their desired shape, I secured the trees to the layout with full-strength white glue. You could also use CA.



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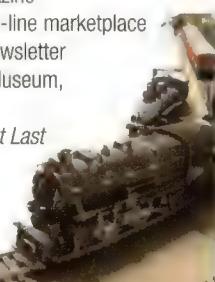
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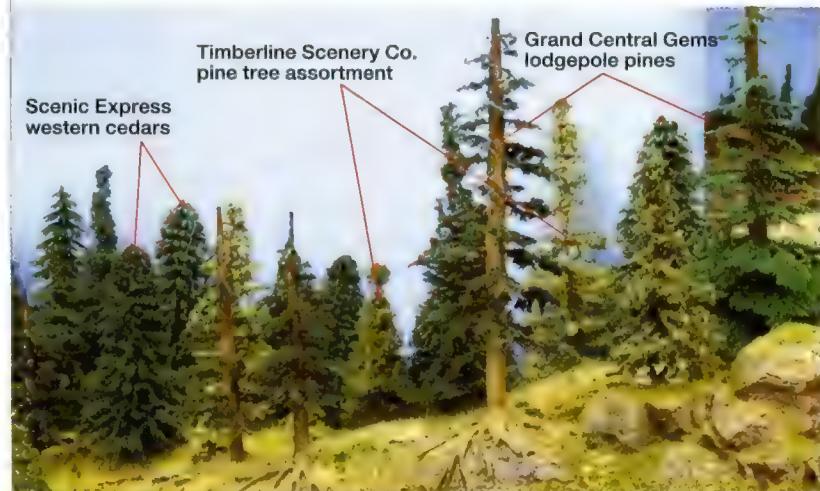
Step 3 Filling in the forest



With the foreground trees planted, I began filling in the rest of the forest. I placed the Scenic Express and Timberline Scenery trees on the layout to see how they'd look. Once I was satisfied with the position of the trees, I marked the locations with a felt-tip marker and drilled holes at those spots.



I put white glue in each hole and planted the trees. Since the trees from Scenic Express and Timberline Scenery Co. have wire trunks, it's easy to bend them so they'll stand vertically.



Here we see a portion of the completed forest. By using trees from different manufacturers, I was able to model a realistic wooded area with trees of different colors and heights. The trees with exposed roots do their part in drawing viewers into the scene, while the background trees help convey the feeling of a wooded grove.

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The main line, passing siding, and spur all have distinctive looks on Paul Dolkos' HO scale diorama. Follow along as Paul describes the different techniques he uses to model each type of track and roadway.

Modeling different types of track

Make your main lines, sidings, and spurs more realistic

By Paul J. Dolkos • Photos by the author

Railroads refer to track and ballast as the roadway. Even on the same prototype railroad, the look of the roadway can vary greatly. These track, ballast, and scenery variations offer a lot of modeling opportunities when you adapt them to your model railroad.

The condition of a roadway depends on how it's used. A main line usually has heavy rail and closely spaced ties on a pristine mound of gray rock ballast. A siding or secondary line often has lighter rail on a shallower mound of darker-colored ballast. An industrial

spur can have wider spaced ties and rails that are obscured by weeds or partially buried by dirt.

The condition of the roadway can also reflect the prosperity of a railroad, since track maintenance is expensive. For example, as the number of railroad



Fig. 1 Height variation. Sidings often have shallower ballast piles and lighter rail than main lines. On his diorama Paul used HO scale roadbed and code 100 track for the main line and N scale roadbed and code 83 track for the siding.

bankruptcies increased throughout the 1960s and 1970s, many main lines were weed-covered and unkempt.

For this article I built an HO scale diorama with a main line, siding, and an industrial spur. I'll use it along with some examples on my home layout to give you some ideas for how you can model each different type of track.

Varying roadbed height

One of the first things that you'll notice about prototype track and ballast is that the main line is higher than secondary lines, such as sidings. Industrial spurs and yard tracks are often at or near ground level.

For my diorama's track I used cork roadbed to represent the height of the ballast pile. A layer of prototype ballast usually ranges between 12" and 30" with the largest amount of ballast reserved for main lines.

As you can see in **fig. 1**, I used HO scale roadbed for the main line and N scale roadbed for the siding on my scene. This provides about a scale 7" difference in height. I laid the track for the industrial spur directly on the plywood subroadbed.

Track codes and tie spacing

Model railroad track comes in different rail heights, referred to as codes. Some common codes are 100, 83, 70, and 55, which represent 156-pound, 132-pound, 100-pound, and 75-pound prototype rail.



Fig. 2 Tie spacing. Most flextrack has tie spacing appropriate for main lines. For spurs Paul moves ties farther apart after first cutting the connecting links.

Prototype railroads often used different size rail for main lines and secondary lines. Maintenance-of-way departments laid the heaviest rail along the main line and the lightest on industrial sidings and spurs.

On my diorama I used code 100 rail on the main line and code 83 on the passing siding, as you can see in **fig. 1**. You could also use code 83 for the main line, code 70 for passing sidings and other secondary lines, and code 55 for industrial sidings and spurs.

Tie spacing varied between main lines and secondary lines. Heavy-duty main lines typically required 24 ties per 39-foot rail section or a tie spacing of 11½" between tie edges. Sidings and spurs can have as few as 19 ties per each 39-foot section of rail, with ties spaced 16" apart.

Most flextrack has ties spaced appropriately for a main line. For secondary tracks, I cut the plastic connecting links as shown in **fig. 2**. Then I space the ties a few scale inches farther apart



Fig. 3 Weathering ties. Wood ties, even those treated with creosote, turn gray as they age. Paul replicated this effect by applying a wash of alcohol and Polly Scale Dust. He brush-painted the rails with brown and rust colored acrylics.



Fig. 4 Ballast variations. On Paul's diorama the siding (left) has cinder ballast with a few weeds between the ties while the main line has crushed-rock ballast and is weed-free. Railroads didn't maintain sidings as rigorously as main lines.

before laying the track. For industry spurs I'll also skew several ties.

Weathering track

After laying the track, I airbrush it with Polly Scale Roof Brown. This flat, neutral color eliminates the sheen of the plastic ties and the bright metal shine on the rails.

Using a clean cloth or paper towel, I immediately wipe the railhead clean

after applying the paint. This ensures that paint won't interfere with the electrical conductivity between the rails and locomotive wheels.

As with other pieces of railroad equipment, exposure to the elements takes a toll on rails and ties. Main line track is usually in better condition than secondary track.

Even creosote-treated ties turn gray over time. I simulate this by applying a

wash of Polly Scale Dust on the ties, as in **fig. 3**. The wash consists of one part paint and four parts isopropyl rubbing alcohol. You could also drybrush the ties for a similar effect.

After weathering the ties, I brush-paint the sides of the rails. I use Polly Scale Grimy Black for main line track. I use rust and brown colors on sidings and spurs.

Types of ballast

Ballast varies according to the railroad's era, volume of traffic, and location. The earliest railroads used the most readily available material, including sand, dirt, and oyster shells. These materials trapped water, causing ties to rot, and proved more likely to wash away during a downpour.

Crushed rock quickly became the preferred material for ballast. The hard edges of the individual pieces interlock and provide a solid foundation for the track and ample drainage for water.

Railroads usually purchased ballast from local on-line quarries. Most railroads used granite when available, although some used limestone where that rock was more prominent.

In the steam era and into the diesel era many railroads used cinders and crushed blast furnace slag as ballast on secondary lines and spurs. On some main lines cinders were used as sub-grade under rock ballast. Many Western and Southwestern railroads used



Fig. 5 Gravel-covered siding. Gravel from an adjacent lot can mix with ballast on a siding. Paul partially covered this siding (lower right) at the freight house on his home layout. He embedded the rails of the spur (at left) into the parking lot.

oil-fired steamers, so those roads had no ready access to cinders for ballast.

Individual pieces of ballast range from $\frac{3}{4}$ " to 3" in size. Pieces of cinder ballast are usually at the smaller end of that range.

When choosing the ballast for your model railroad, examine the size of the individual pieces and don't simply rely on the scale marked on the package. Many modelers use N or Z scale cinder ballast on their HO scale layouts for a more prototypical appearance.

Model railroad ballast is available in a variety of colors, so you shouldn't have much difficulty matching the ballast found on your favorite prototype. Some modelers worry about running out of a certain ballast color. However, this happened on prototype railroads as well when a maintenance-of-way department had to change suppliers or a quarry closed.

Other ballast color variations show how well a stretch of track is maintained, as you can see in **fig. 4**. Ballast on secondary lines is less frequently cleaned and renewed than on main lines. If you're not using cinders for secondary lines, you can model this practice by choosing a darker colored rock ballast for your sidings and spurs.

On sidings or spurs next to lots or driveways, vehicle traffic can cause dirt or gravel to partially cover the ties. I modeled this effect on the siding in front of the freight house on my HO

Making dirt grade crossings and gravel lots



On his diorama, Paul built up a gravel lot using layers of cardboard. He used real powdered dirt as ground cover for the road surface.

On some secondary lines the space between the ties is filled with dirt to form a simple grade crossing or gravel lot. I added a gravel lot to the spur on my diorama. The following technique is less messy than using plaster alone.

First I cut pieces of cardboard to fit the space between the rails and the approaches to track. You could also use foam board or styrene. I built up the area where the lot crosses the tracks to a height slightly below the railhead to ensure that locomotive wheels wouldn't lose electrical contact. I also allowed about $\frac{1}{16}$ " on each side of the cardboard for flangeways. Then I attached the cardboard to the track and scenery with white glue.

I blended the edges of the cardboard to the scenery base using plaster. Once the plaster dried, I painted it and the cardboard with tan latex paint. Then I sprinkled the wet surface with fine dust that I collect from a dirt road near my home. I used ground foam to model a few random weeds.

After all of the scenery had dried, I cleared the flangeways with a utility knife. Then I lightly sanded the gravel lot to simulate tire tracks from vehicles crossing the tracks. – P.J.D.



Fig. 6 Clumps of weeds. Paul used Silflor MiniNatur Prairie Tufts and ground foam along the roadway and between the ties of the spur.



Fig. 7 The end of the line. Stub-end yards offer a lot of scenicking opportunities. Paul used prairie tufts and ground foam in this scene on his home layout.



Fig. 8 Grass seed follicles. Using tweezers, Paul pulled follicles off a grass seed tassel. He used this material to model tall weeds and grass.

scale Boston & Maine layout, shown in **fig. 5**. At some locations the space between the rails may be filled with earth to accommodate vehicles. See “Make a dirt grade crossing” on page 41.

Weeds and grass

Secondary lines and spurs usually have various amounts of vegetation encroaching the roadway. A lightly trafficked branch line may have a few scattered clumps of grass sprouting from the ballast, while a seldom-used spur may have large patches of tall weeds growing between the ties.

I use many different colors of scenery material. Along with shades of green, I use yellow and brown material to depict dry or dead vegetation.

I sprinkle fine and medium ground foam along the roadway and between the ties to depict small weeds. You can see the results in the siding shown in **fig. 4** on page 40. I secure the ground foam with a 4:1 solution of isopropyl alcohol and white glue. Before the glue dries I pick off any pieces of foam that have landed on top of the ties.

I use a variety of products for taller vegetation. If you still want to run trains over the track, make sure that any material that you install between the ties is flexible and doesn't derail rolling stock.

For larger clumps of weeds, such as those between the ties of the spur shown in **fig. 6**, I used Silflor MiniNatur Prairie Tufts. This product is sold in 8" x 12" sheets of about 100 tufts. Each tuft peels off the sheet and is easy to install with white glue or scenery cement. This product is available in $\frac{1}{8}$ " and $\frac{3}{8}$ " heights.

Prairie tufts and ground foam also worked well at the ends of the tracks in a small yard on my home layout, as shown in **fig. 7**. A small stub-end yard at an industry or on a branch line is another location where tracks and ballast can be less maintained.

I apply static grass flocking for large patches of tall grass. Although some of the flocking material will land horizontally, enough of the strands will remain vertical to simulate a realistic grass texture.

First I apply white glue to the locations where I want patches of tall grass. Then I add the flocking using a shaker squeeze bottle (often called a puffer). Static electricity makes some of the fibers land vertically in the glue.

For better results you can use a Noch Gras-Master tool to apply flocking. This device electrically charges the fibers, causing a higher proportion of them to land vertically.



Fig. 9 Tall weeds. For the seldom-used spur on his diorama, Paul used grass seed follicles (left, foreground) to model tall weeds and applied static grass (right, foreground) for large areas of unkempt vegetation.

I've also had good results using individual follicles from a grass seed tassel, like the one shown in **fig. 8**, to model individual tall weeds. I pull off the follicles with tweezers and attach them to the layout with white glue. The follicles have a thin profile that's perfect for HO scale grass, but the material is fragile and requires some patience to install. I also use these grass seed follicles to model tall weeds near building foundations and retaining walls.

I installed grass follicles and static grass next to the siding shown in **fig. 9**. As on the prototype, a weedy siding or spur provides an interesting contrast to a neatly ballasted main line on a model railroad.

An even greater contrast to a highly trafficked main line is an abandoned right-of-way with half-buried ties, torn-up rail, and assorted debris like that shown in **fig. 10**. Partially dismantled track is an interesting scenic detail.

Whether a high-speed double-track main line or an overgrown industrial siding, accurately modeling different types of track will make your layout look more like a real railroad. **MR**

Paul J. Dolkos is a frequent contributor to Model Railroader. His series of articles about detailing the railroad right-of-way appeared in the November 2007 through January 2008 issues.



Fig. 10 Abandoned right-of-way. Modeler Dale Latham added a torn-up siding on his layout. The scene offered a lot of modeling opportunities.

Superelevating flextrack



Andy Schnur developed a simple method for superelevating curves on his layout, the results of which are seen here.

Build up ramps of masking tape to give track curves a realistic profile

By Andy Schnur • Photos by the author

John Armstrong says in his book *Track Planning for Realistic Operation* that superelevation isn't necessary for our models to run properly. But, he adds, "Using it adds so much to appearance that many experts consider it a must." So, when I started building my dream layout about 15 years ago, I wanted to superelevate my curves. But how?

Superelevation – raising the outside rail of a curve ever so slightly so trains lean into the turn – is one of the few track-

work techniques Armstrong doesn't explain in his book. Other sources of information are scarce as well, so I developed my own method. Follow along as I show you my technique. **MR**

Andy Schnur has been reading Model Railroader since he was 12 years old. His Chesapeake & Ohio layout was featured in the February 2005 issue of MR. He is retired and lives in Lafayette, Calif., with his wife Ellen. They have two daughters.

Easing into curves



Small nails hold one end of a wooden spline in line with the track approaching the curve. Bending the batten produces a smooth, natural curve, without kinks.

When I started building my layout, there was no such thing as ready-made Code 83 flextrack, so I used Shinohara Code 70. Though this is the correct rail height for the era I model in HO, it requires careful installation. Therefore, I pulled a page out of Armstrong's book to lay out easements for my curves.

I started with a thin, flexible wood spline about 3 feet long that I ripped from a piece of $\frac{3}{4}$ " scrap lumber with a table saw. Another option could be to use a piece of scrap molding picked up at a lumber yard, or even a wood yardstick.

I tacked a few $\frac{3}{4}$ " brads into the plywood subroadbed to hold one end of the spline in line with the tangent track. Then I bent it until it touched the track curve that was already laid out, and marked the curve made by the spline on the subroadbed with a pencil.

It's important to make sure that the first brad is at least 6 to 9 inches from the beginning of the easement curve. This guarantees the track centerlines will align.

Cardboard and masking tape ramps



A cardboard strip placed in the middle of a wider strip of masking tape makes a shim for superelevating curved track. Below it, layers of tape are built up to create ramps.



Andy has applied the superelevation pieces to the cork roadbed. Since they were made of masking tape, they will stay in place on their own, without adhesive.

Andy has laid Micro Engineering track on the roadbed, using spikes driven through holes drilled in the ties on the outside of the rails. Spikes through the center of the ties could warp the track.

Cork roadbed doesn't swell when exposed to water, such as that in the thinned glue mix I use to secure my ballast. I needed a shim material that likewise was resistant to water, as well as flexible and easy to handle.

I started out with a sheet of $1/32$ " cardboard, which I cut into $1/4$ " wide strips. Cardboard will swell when exposed to water, so I centered each 11" long strip on the sticky side of a strip of $3/4$ " masking tape. The cardboard-and-tape combination is still fairly flexible, and it doesn't interfere with spiking the track down. The tape both protects the cardboard from water and provides an easy way to attach it to the outside curve of the cork roadbed.

That took care of the radial curve, but a flat track can't transition to a superelevated curve abruptly. I needed a shim that was 6" or so long, $1/4$ " wide, and went from $1/32$ " at

one end to 0" at the other. And it had to be bendable. Once again, the solution lay in the masking tape.

On a piece of clean glass, I stuck a 6" long strip of tape. I then cut a 5" piece and stuck it on top so that they aligned at one end. I continued this with 4", 3", 2", and 1" strips, stacking them to form a ramp. Then I used my hobby knife to square off the ends and cut it into three shims, each $1/4$ " wide. If I need a taller shim, I use more layers of tape and adjust the length of the pieces and their spacing accordingly. I then stuck down the tape shims on either end of my cardboard ones, bending them to follow the curve.

To secure the track, I put spikes through holes drilled in the plastic ties on the outside of the rail. Spikes through the middle of the track could bend the ties and force my rails out of gauge.

Superelevating curved turnouts

I used quite a few Shinohara no. 8 curved turnouts on my layout, and I wanted to superelevate these as well. Even when installing them flat, these turnouts must be placed with care to avoid kinking the diverging track. Therefore, I use a cardboard template with a $29\frac{1}{2}$ "-radius curve on the outside edge to check the diverging track for kinks.

I find that even with the best of planning, kinks often appear because cork roadbed isn't strong enough to hold these turnouts in place. I now use basswood in place of cork under my turnouts. I don't usually keep $3/16$ " basswood on hand, so I layer a $1/8$ " thick piece on top of a $1/16$ " piece.

I use the cardboard and tape shims under the entire outer rail of the curved turnout. This will leave the diverging track flat. Then, starting just beyond the frog, I use a tape shim to gradually raise the outside rail of the diverging track to superelevation height. I don't try to superelevate the frog itself. Then I continue down the outer rail of the diverging track with cardboard and masking-tape shims.

I keep checking the track with a standards gauge throughout this process. Once I have the track nailed down, I run as many trains over it as I can, in both directions. This helps me spot kinks, dips, humps, out-of-gauge track, and any spots where locomotive pilots or coupler pins could snag on the trackwork. I also check all the rail joints and file off any burrs I find. The time to make corrections and adjustments is now, not after the track has been ballasted and weathered.



Andy uses a large number of curved turnouts, like the one in the center of this picture, on his layout. Andy uses the same technique detailed above to superelevate the outside rail on both the main and diverging routes. The white sticks seen above are styrene to maintain rail gaps.



Improving Atlas code 83 flextrack

Trim down the molded spikes and add weathering for more realism

By Eric Brooman • Photos by the author

Today's HO modelers are fortunate to have a selection of realistic rail sizes to work with that correspond to typical prototype rail sizes. This allows modelers to build good-looking track with appropriate rail sizes for heavy traffic areas as well as secondary, yard, and industrial tracks.

When I began my Utah Belt layout, there were only two choices of nickel-silver rail: code 100 and code 70. For newcomers, these code numbers refer to the rail height in thousandths of an inch: code 70 measures .070" in height, while code 100 is .100" tall.

Prototype rail is designated by its weight per yard. Code 100 represents a very heavy rail size (156 pounds per yard) that was used only on the Pennsylvania RR, while code 70 (representing 100-pound rail) was actually a bit

light for the type of up-to-date, present-day railroad I was modeling. Of these choices, I decided to go with handlaying code 70 as its smaller size looked more realistic.

By the time my family moved to a new home in 1999, code 83 flextrack was readily available. This size rail was .083" tall and represented prototype 132-pound rail that was common for modern main lines. I immediately adopted code 83 as the Utah Belt's standard mainline rail.

Time constraints

I've always enjoyed the challenges of handlaying track, but I also had a commitment to provide a home layout tour for the National Model Railroad Association's 2001 National Convention in nearby St. Louis. With the convention

just 18 months away, flextrack provided the means of getting more than 300 feet of track up and running quickly.

I wound up handlaying all of my turnouts and most of the secondary track and industrial spurs built with lighter rail. But the main line and its primary passing sidings were all laid with Atlas code 83 flextrack, and it went in rapidly.

I was well satisfied with the overall use of Atlas flextrack, but subsequent closeup photography revealed oversize nubs of plastic that held the rails in place. In my photos, these molded "spike heads" stood out and looked about the size of work boots when compared to prototype spike heads, which are all but invisible from any distance. I wanted to do something to make my track look more prototypical.



A no. 17 X-acto chisel blade makes short work of trimming off the molded nubs from the Atlas code 83 flextrack. A used blade is less likely to dig into the soft metal rails.



This close-up compares Atlas flex-track with the trimmed spike heads (along the near rail) to a section that has the original plastic nubs.



Eric uses a grungy brown artist's acrylic color to paint the ties and sides of the rails. He then ballasts the track with Woodland Scenics cinders and diluted white glue.

Trimming the nubs

After rejecting the idea of replacing all of the flextrack, I tried to reduce the size of the offending plastic nubs by trimming them. An X-acto no. 17 chisel blade seemed like the best tool to handle this job. I held the side of the knife blade even with the side of the rail and

pressed the cutting edge against the nub. Unfortunately, the entire plastic nub popped off! Great! Now what was going to hold the rail in place?

Several more tries at different angles weren't successful either. As the nubs continued to pop off, I wound up with a couple of inches of track without any nubs on one side. However, I was surprised to find the rail remained solidly in place. Evidently there was just enough plastic remaining to hold the rail tight against the unaltered nubs on the opposite side. All right!

This discovery allowed me to clean off the nubs along the visible side of the rail. In the process of removing the remaining nubs, I learned that a used no. 17 blade worked best as its duller edge didn't dig into the soft metal rail.

Removing the nubs worked well for me thanks to my layout's linear track plan. Only one side of the track is visible, so the nubs remaining on the hidden side are masked from view by the rails.

I experimented with removing the nubs from both sides of the rail, but this loosened the rail too much and made it easy to dislodge. A few drops of cyanoacrylate adhesive (CA) secured the rail for short distances, but I didn't try this on any longer stretches. If your track is seen from both sides, my feeling is you'll have to choose which side will be most obvious to work on.

Painting and weathering

I paint the sides of my rail and ties with a grungy shade of dark brown. To help hold the rail in place, I use full strength artist's acrylic paint and wipe off the railheads before the paint dries. All of my track is ballasted. I use diluted white glue to hold the granules in place. Both the paint and the glue help secure the rail. When everything is dry, I polish any residue off the rail heads with 600-grit sandpaper.

During the more than six years of operating my layout, I haven't had any problems with the trimmed flextrack. At first glance, it's hard for most people to tell where the flextrack joins my hand-laid turnout rails.

This easy technique can be done to improve the appearance of new track, or track that's been installed for many years. The Atlas code 83 flextrack is a great product, and this little modification makes it look even more realistic. **MR**

Eric Brooman has been building and sharing his modern era HO scale Utah Belt for more than 30 years. He's a prolific author whose numerous articles have been published in Model Railroader and Great Model Railroads.

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steam and sand dome, solid pilot wheel long air tank on

engineer's side

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NP LW Divided Coach and NYC L-4/a-b 2-8-2, FP - BLI

72 seat Coach, Plated, FP N&W K-2 4-8-2, FP - PSC

Soo Line 2-8-2, FP - DivPt NP Q-3/4 6-2, FP by PSC

SP C-9/10 2-8-0, FP - CHL SP Mk-7/8/9 2-8-2, FP - NBL

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2nd in a
4-part
series

4 WEEKS TO A BIGGER LAYOUT

Week 2: Laying and wiring the track for the Waterbury Industrial District

By David Popp • Photos by the author

While the 2 x 3-foot size of my Waterbury Industrial District may not seem very large, it does have 6 turnouts and more than 12 feet of N scale track on it – meaning that laying and wiring the track was going to take more than just a single evening to complete. If you remember from Week 1 of

the project, featured in the September 2008 *Model Railroader*, I was under the gun to finish the addition, complete with scenery, in time for the next operating session, which at this point was only three weeks away.

Since I was building the industrial district (shown in the illustration) as

an addition to my N scale Naugatuck Valley RR, I used many of the same techniques as I did when I built the original layout. As shown in the following steps, I completed most of the work involving cutting and fitting sections of track, soldering the rail joiners, and wiring the feeders at my workbench.



Switching cars in the Waterbury Gas Works complex is fun, thanks in part to its carefully laid track and turnouts. In week two of the series, managing editor David Popp explains how he installed the reliable-running track on the addition to his N scale layout.

This technique not only saved time, it also meant that I could do the work in good lighting with all of the proper tools at hand. Only after I'd laid the cork and finished shaping the scenery (shown in last month's installment), did I install the assembled track sections on the layout and connect them to the rest of the railroad.

Good track work is fundamental to a reliable model railroad, and this is one step in the project where you really want to exercise patience and take the time to do the job correctly. Poorly laid track never improves with age, so make any necessary corrections now.

By the time I'd gotten my track fit, wired, cemented to the industrial district, and painted, another week of evenings had slipped from my schedule. I still had a lot of ground to cover (literally), and just two weeks left to do it in to meet my goal. **MR**

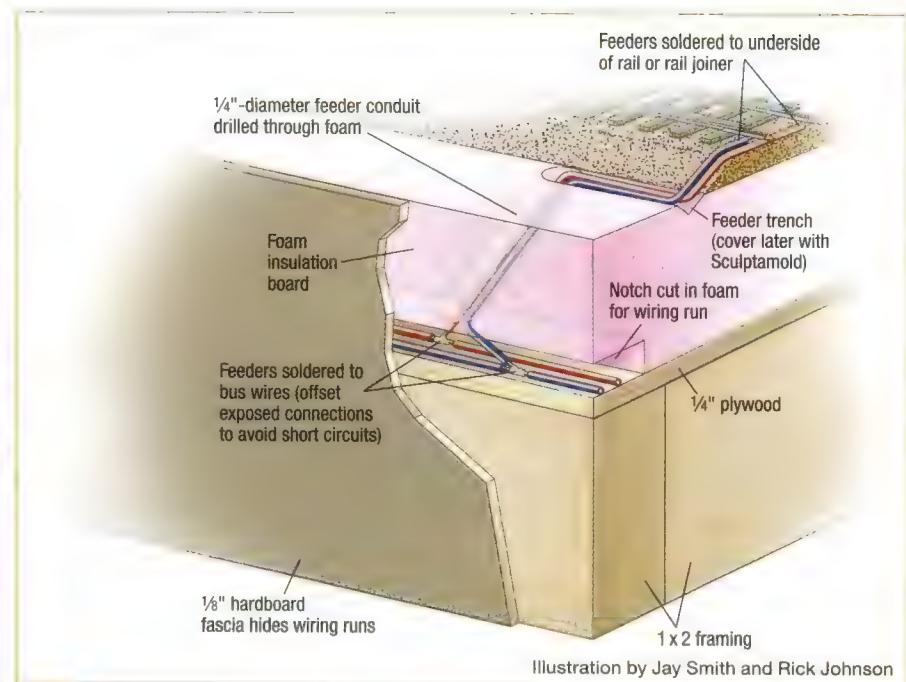


Illustration by Jay Smith and Rick Johnson

Where the wires run

I like neat wiring. I therefore hid the main track power bus inside a channel cut into the foam scenery. As shown in the illustration (and in practice on page 51), the wires are directly behind the fascia, and in most places, are quickly accessible by removing three or four screws.

The feeder wires are routed through small holes in the foam to the bus wires, and the feeder/bus connections are soldered at staggered intervals to prevent accidental short circuits. – D.P.

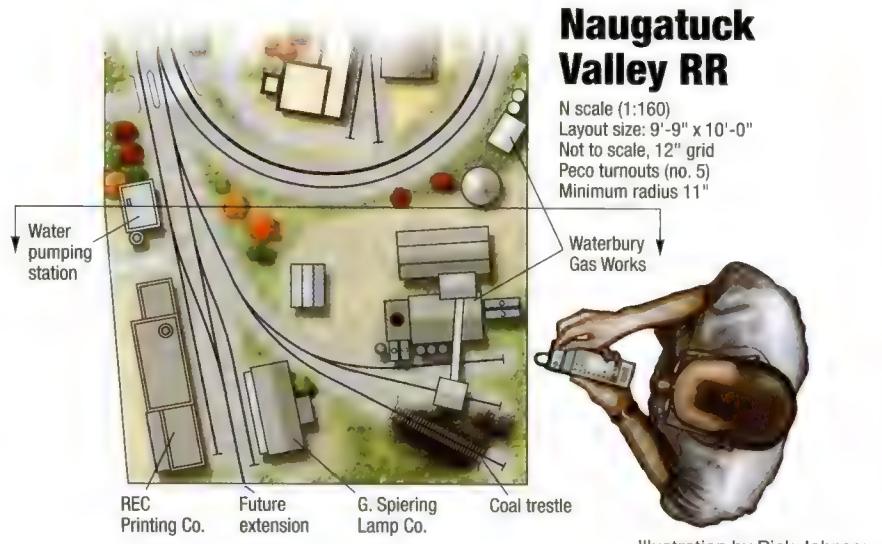


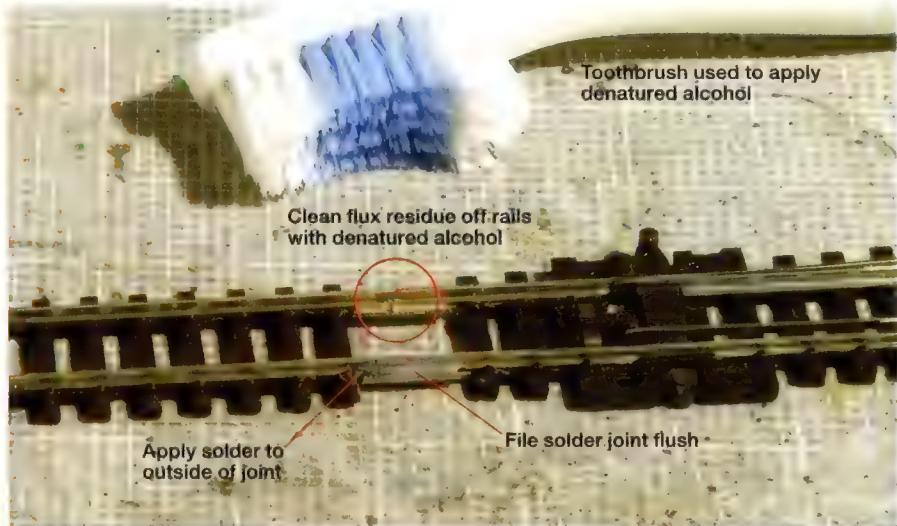
Illustration by Rick Johnson

► 4 weeks to a bigger layout series

Week 1 (September 2008): Planning the industrial district, building benchwork, and starting the scenery

Week 3 (Coming next month): Adding ballast, grass, and a coal trestle to the industrial district

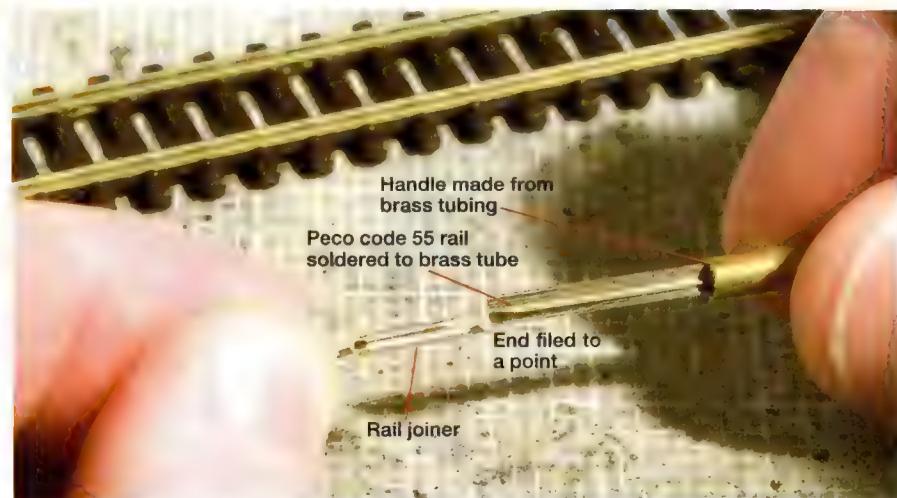
ASSEMBLING TRACK



Most of the rail joints on the addition are soldered. Coat the joint with a small amount of flux, then heat the outside rails and apply the solder.



After each section of track was soldered, David double checked his work by placing the track on the layout to make sure it fit properly.



David made a tool to open up rail joiners so they would easily slip over the double-web rail of the Peco code 55 track.

When I started building my Naugatuck Valley layout several years ago, I selected Peco N scale code 55 track for the railroad. I used the same Peco track for the industrial district project, so everything would match.

Regardless of the scale you work in, rail codes correspond to the rail's height in inches. Therefore, both N scale and HO scale code 55 rail is .055" tall. Code 55 rail looks good for N scale mainline track, so that's one of the reasons I chose it for my layout.

I also like the fact that Peco turnouts come with a built-in toggle spring for the switch points. You can set a Peco turnout by pushing the point rails with your finger, and the spring holds the points in place. The spring eliminates the need for a switch machine, ground throw, or some other latching mechanism, and since all the turnouts on my layout are within easy reach, the finger-activated turnouts work well for me.

I laid the Waterbury Industrial District's track in preassembled sections. After setting the track components (turnouts and flextrack sections) on the layout to measure them, I took the track pieces back to my workbench. There I cut the flextrack pieces to size and soldered the rails together as shown in the top photo.

To solder the rail joints, I apply a small amount of rosin flux on the rail and joint surfaces. I then heat the joint with a fine-tip soldering iron and flow in 60/40 rosin-core solder. (The flux and solder are available from RadioShack and other electronics suppliers.) I apply the solder to the outside of the rail and let it flow into the rail joiner.

After the solder cools, I clean off the excess rosin with denatured alcohol, and then I touch up the solder joint with a small file as needed.

While I used Peco code 55 turnouts and flextrack for my project, at the time, I had difficulty getting Peco code 55 rail joiners. Instead, I used Atlas N scale rail joiners, which have openings slightly narrower than the Peco rail web. To open the joiners so they'd slip easily over the Peco rail, I made a tool from a piece of rail that I soldered into a small length of brass tubing used as a handle. I then filed the end of the rail to a point.

To use the tool, I slide a new Atlas rail joiner onto the filed end of the rail to open the joiner. I then remove it from the tool and slip it onto the track section. It works like a charm.

FEEDERS AND JUMPERS

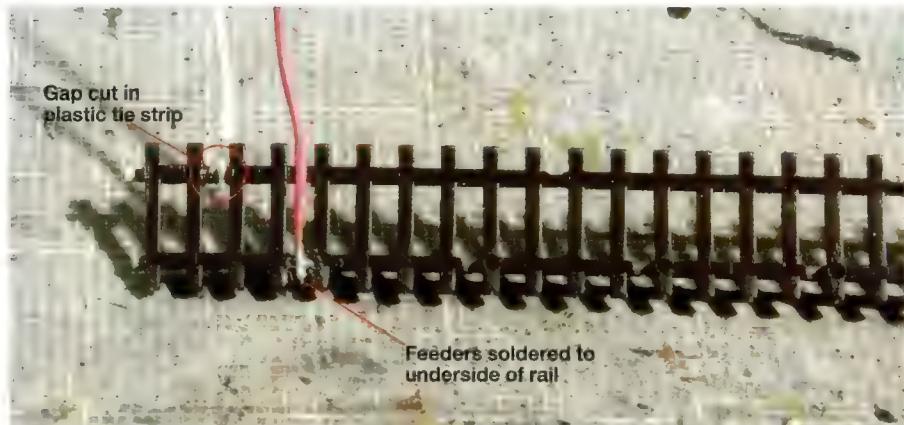
While you're assembling sections of track at the workbench, this is also a good time to add the feeder wires.

I use 22 gauge wire for the track feeders on my railroad. While you can solder the feeders to the sides of the rails, attaching them to the bottom of the rail or rail joiners, as shown in the top photo, makes a much neater finished job. To use this technique, however, you need to attach the feeders before you've laid the track.

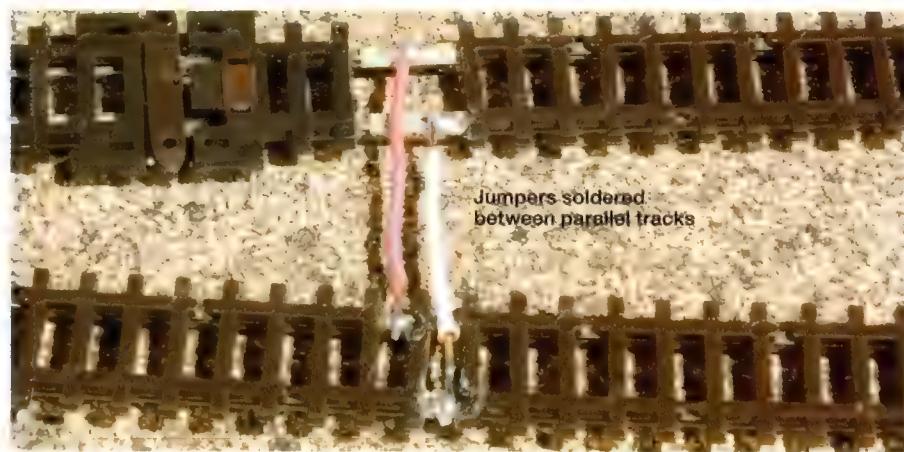
To connect a feeder, I start by cutting a gap in the plastic tie strip on the bottom of the piece of rail. I then strip a $\frac{1}{4}$ " of insulation off the end of the feeder wire. Next, I apply a small amount of rosin flux to the end of the feeder and the bottom of the rail and tin both of them. Tinning is the process of heating the wire or rail and melting a small amount of solder to it.

Once the pieces are tinned, I set the feeder wire in position on the rail, and then heat both the rail and wire with the tip of my soldering iron. Once the solder melts (fairly quickly), I remove the iron and hold the parts together until the solder becomes solid again. You can tell if you have a good solder joint if the cooled solder is shiny. Dull-gray solder means you have a bad joint. You can fix it by melting the solder again.

If you have a place where two tracks run parallel, you can install jumpers between the tracks (shown in the lower photo) instead of using more feeders.



Since feeders are hard to hide in N scale, David solders them to the underside of the rails or rail joiners before he lays the section of track.



In places where tracks run parallel and are part of the same circuit, you can use jumpers, as shown here, to feed the new track.

CONNECTING TO THE BUS

Before I lay the track on the layout, I mark the position of the feeder wires on the roadbed. I then drill $\frac{1}{4}$ " holes in the layout for the feeders, as shown in the illustration on page 49.

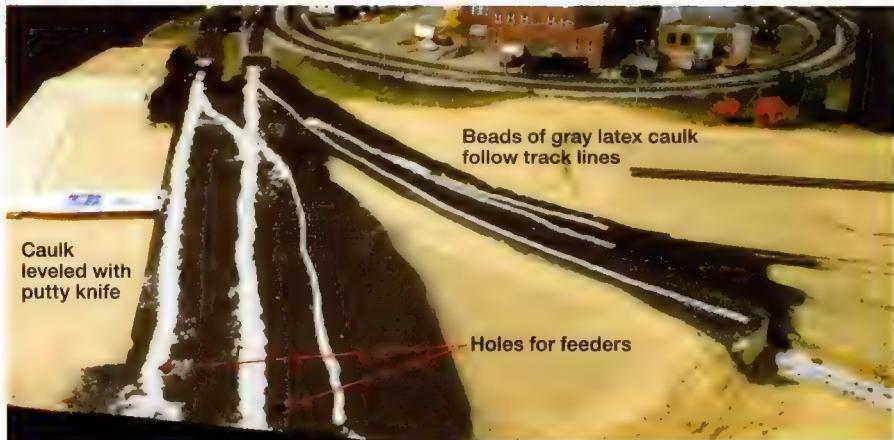
Once I've laid the track (shown in the next step) I trim the feeder wires to their final length, strip a $\frac{1}{4}$ " of insulation from the ends of the wires, and tin the ends in preparation to connect them to the track bus wires.

Since I have a small layout, I used 18 gauge wire for the track bus, but 16 or 14 gauge wires are better choices for larger railroads. To connect the feeders to the bus wires, I carefully strip about $\frac{3}{8}$ " insulation from the bus wire and tin the exposed wire. I then hook the end of the feeder around the bus and heat it with the soldering iron to make the joint.

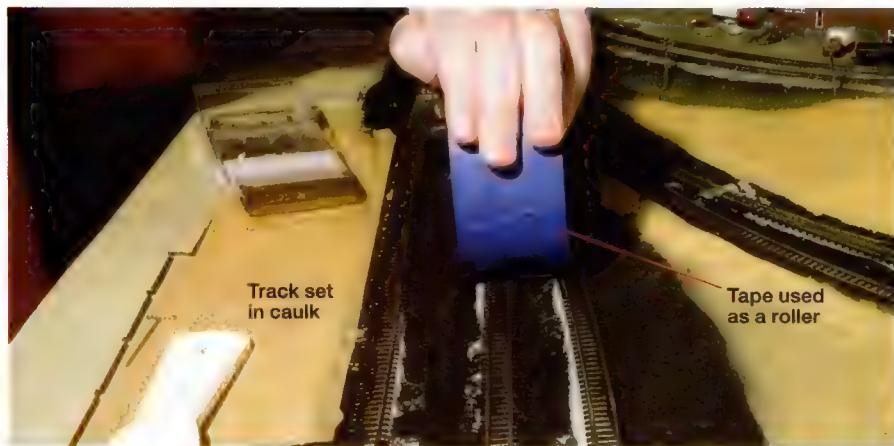


Once the track is laid, slip the feeders through the holes in the scenery and solder them to the track bus. David used 18 gauge wire for his track bus.

LAYING TRACK



The track is affixed to the layout with latex caulk. After laying a bead of caulk along the track centerline, David leveled the bead with a putty knife.



To seat the track into the caulk, David used a roll of masking tape as a make-shift roller. Be sure to clear away any caulk that oozes over the tops of the ties.

Once I had the track sections assembled and wired, I was ready to start installing them on the layout.

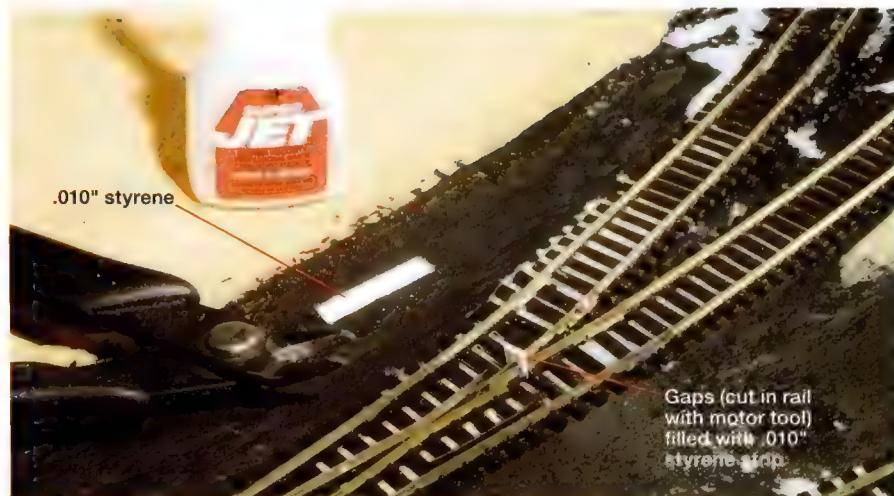
I began by test-fitting the sections. After I was satisfied with the position of each section, I marked its track centers at key points on the roadbed with a fine-tip marker. I also marked where the switch points would be located. I then removed the track and set it aside.

To lay the track on the layout, I first applied narrow beads of DAP gray latex caulk along the track centers. Then, as shown in the top photo, I used a putty knife to level the beads of caulk so that they were about half the thickness of the tie strips on the Peco code 55 flextrack. I then scraped off the caulk where the turnout points had been marked to keep the adhesive from rendering the turnouts inoperable.

Getting the caulk to the correct thickness is a bit of a balancing act. You don't want the caulk to be too thick, or it will ooze up through the ties and make it difficult to ballast the track later. If the caulk is too thin, it won't hold the track in place. It takes a little practice to get it just right. In case of a disaster, latex caulk is water soluble, so you can clean the track and try again.

With the caulk prepared, I connected the end of the track section to the previous one and then pressed the track into the caulk. Using a roller (lower photo) will help work the track into the caulk and achieve good adhesion.

INSULATING FROG RAILS



To make sure the insulating rail gaps wouldn't close up with expansion, fill them with a piece of .010" styrene, cemented in place with CA.

I used Peco Electro-frog turnouts on the layout. This have what is called a "live frog," meaning that the frog is powered. Powered frogs are very helpful when running short-wheelbase locomotives. However, powered frogs also require that the two rails leading away from the frog are insulated, or they can cause a short circuit.

There are several ways you can insulate rails on a layout. The simplest is to use plastic rail joiners. While these just take the place of an ordinary metal rail joiner, N scale insulated rail joiners tend to be rather large, and don't look very realistic when photographed.

Instead, I chose to cut gaps in the rail once I'd cemented the track to the layout (shown in the left-hand photo). To cut the gaps I used my motor tool fitted

INSULATING (CONT'D)

with a cutoff disc. The gaps run through the rails just in front of the frog on the turnout. On Peco turnouts, be careful you do not cut too close to the frog, since you can damage the rails that make up the frog parts.

While you can leave the gaps as they are, expansion and contraction of the rail on a layout can be sufficient to eventually close the gaps and cause a short. Therefore, I use small scraps of .010" styrene to plug the gaps.

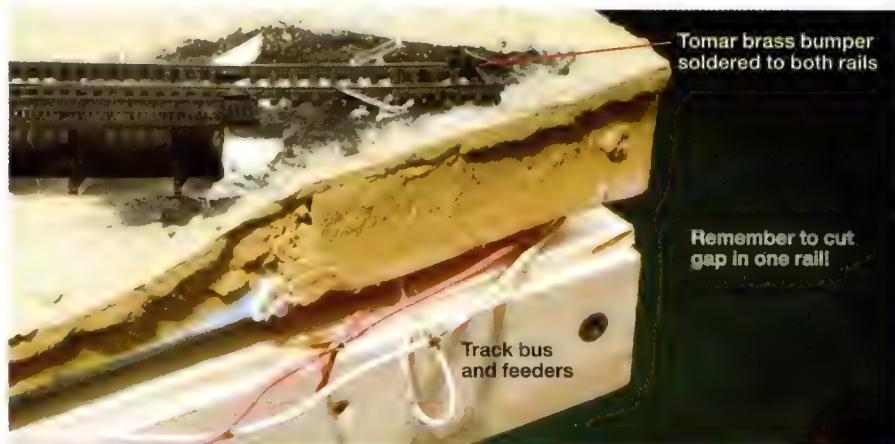
I start by cementing the styrene into a gap with cyanoacrylate adhesive (CA). Once the CA has dried, I trim away the excess styrene with a sharp hobby knife. I then use a needle file to shape the styrene plug to match the rail.

As shown in the photos, I used white styrene for the plugs. Even though I paint the track, eventually, the white can show through, especially on top where the railhead is worn from use. A better choice would be to use gray or black styrene for this project.

One other piece of trackwork on the industrial district needed to have an insulating gap. The Tomar brass bumper that I used at the end of the coal dock is soldered to the rails. Since the bumper is made from small pieces of metal, it will cause a short circuit unless insulated. As explained in the lower photo, this is a point I forgot in my haste to get the layout finished on time. You can easily insulate the bumper by cutting a gap in one of its two rails.



Once the CA is set and the styrene insulator is firm, cut away the overhanging styrene with a hobby knife and file the rest flush with the rail.



After soldering the Tomar brass bumper in place, David forgot to cut the gap to insulated it. A half-hour of frustration followed as he looked for the short circuit.

TESTING THE WORK

With the track laid and wired, it was time to test it. I selected several cars and one of my most finicky engines and ran them through every bit of new track.

I was looking for places that may cause problems, and here and there I discovered I needed to do a bit more filing on rail joints. I also found a few places that the rosin flux hadn't been completely cleaned from the rail.

Once I was happy with how the track ran it was time to work on scenery, which is the subject for next month.

More on our Web site

For an up-close look at the projects from week 1 and 2 of the Waterbury Industrial District, view the subscriber-only bonus video clips for this story at www.ModelRailroader.com



With the track installed and wired, David tested the work to make sure locomotives and cars would run well on the new section.



Author Roger Holmes enjoyed working outside of the box when he built this prize-winning entry for Walthers' 2007 N scale modular building contest.

Constructing a modular building with odd angles

There is no shortage of ready-to-assemble industrial structures or warehouses available to modelers working in N and HO scales. But many of these kits are common designs featuring four square walls. That's why I was pleased to discover Walthers' modular building kits and the many possibilities they offer to create industrial structures with intriguing designs.

Real industrial structures built with right-angled square walls are common-

place along the railroad right-of-way. However, there are plenty of exceptions stemming from the need to bring railroad tracks close to industries in congested urban areas. In some cases, this results in structures with odd-angle or even curved walls.

Since I rarely build any structure kit per the included instructions, I challenged myself to build an odd-angled industrial structure using various Walthers modular components. My resulting

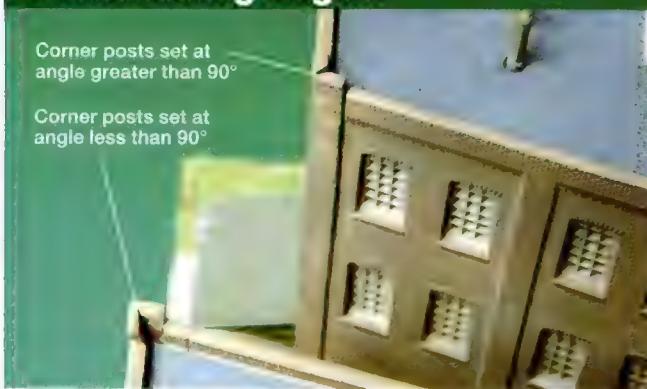
Acute and obtuse corner angles help shape this distinctive N scale structure

By Roger W. Holmes
Photos by John S. Evans

American Supply complex is made of two buildings bisected by an angled railroad siding. Though my structure uses Walthers N scale modular components, the techniques I used also applies to its HO scale modular components. **MR**

Roger Holmes is a trial court judge in Springfield, Ill., and has modeled the Milwaukee Road in N scale since 1970. He has three grown children and is an accomplished stage show drummer.

1 Interesting angles



The key to creating this architecturally interesting industrial structure is to modify some of the L-shaped corner posts (pilasters) to complementing angles greater and less than 90 degrees. While the corners shown here allow the structure walls to parallel the diagonal track, the outside corners of the two buildings are set at 90 degrees.

3 Cutting corners



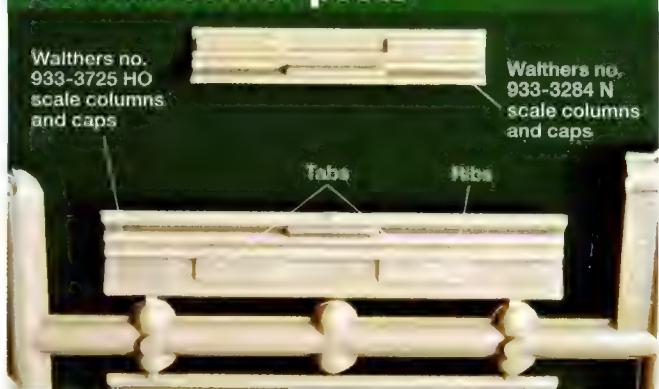
A razor saw equipped with a fine-tooth blade works well to modify the corner posts. After securing a corner post on a non-slip cutting surface, I used the saw to scribe into the crease at a 45-degree angle. These N scale parts are small to handle, so work deliberately and use the two support ribs on the inside of the post to help guide the saw.

5 Acute angle posts



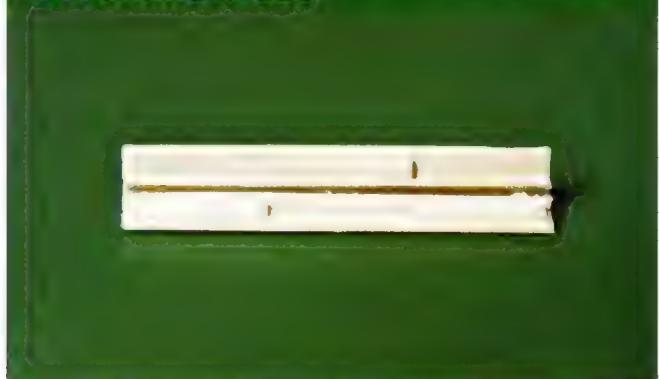
To form an acute angle corner, use a motor-tool to carve away the mounting tabs from one side of the post. It's necessary to remove these tabs to allow one side of the post to bend closer to the opposite side. You'll also need a flat surface on the inside of the post to secure a filler strip.

2 Stock corner posts



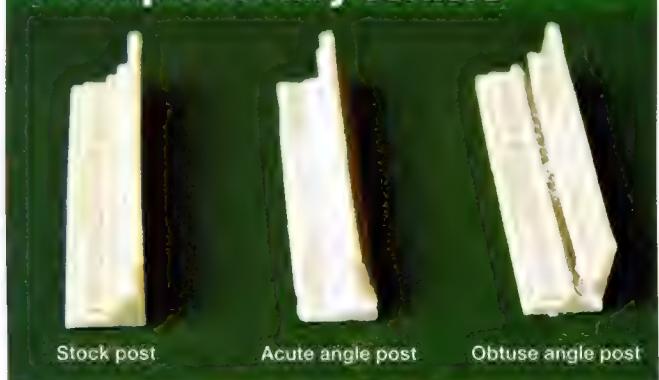
Walther's Cornerstone Modulars have a variety of wall, foundation, roof, column, and cap components for both HO and N scale structures. Modifications to the stock corner posts, shown here, must be done in such a way that the angle of the post can either open or close, yet still join two wall components securely.

4 A shallow cut



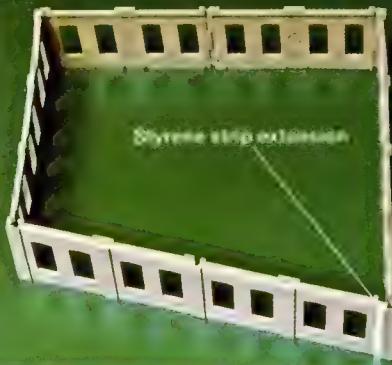
Avoid cutting entirely through the post by using light strokes. Test the depth by removing the saw and inverting the corner post so that the crease faces down on the cutting surface. Then use your thumb to apply light pressure at the joint of the post. When you can spread the post to the desired angle, the cut is deep enough.

6 Complementary corners



Each corner post modified with an obtuse angle needs to be paired with a post set at a complementary acute angle. After shaping the first pair of corners to the desired angles, I repeated the process until I had enough posts to complete my multiple-level structure.

7 Styrene wall extension



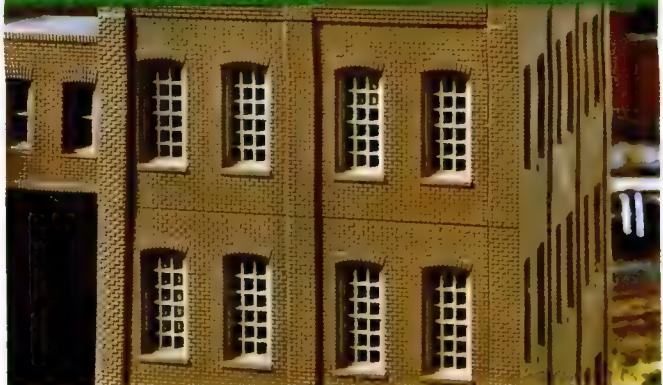
The rear wall of the main building is one bay wider than the front. As a result, the angled side wall will be too short to span the distance between the front and rear walls. To bridge this gap, I used cyanoacrylate adhesive to attach a piece of .080" x .125" styrene strip at the end of the wall.

9 Bridged buildings



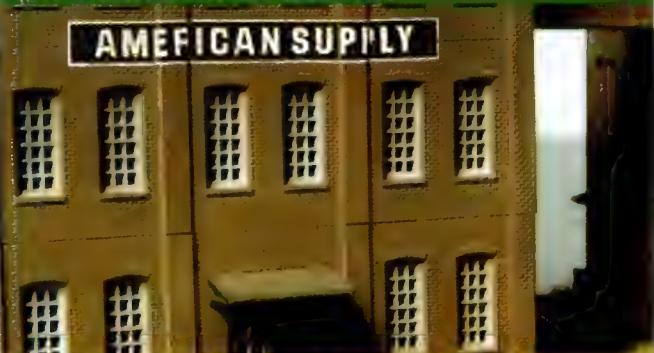
Because the two parts of my industrial structure are separated by a railroad track, I needed a way to connect them. A connection at track level wouldn't be logical, so I used Design Preservation Models (DPM) components to form an enclosed bridge between the third floors.

8 Stacked walls



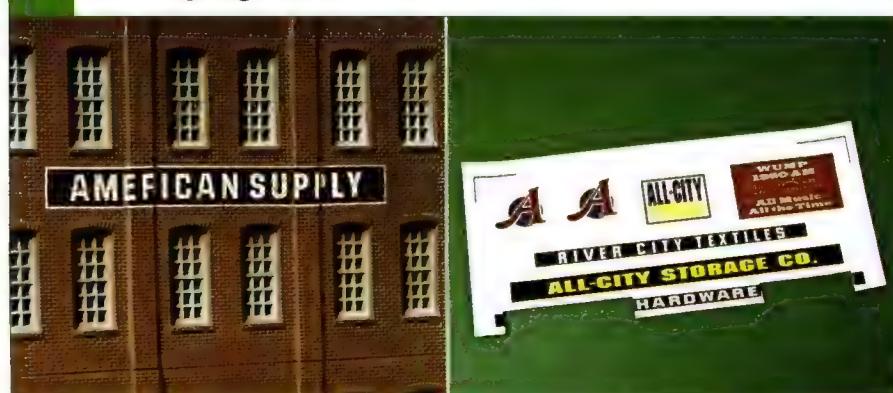
After repeating the previous steps to construct walls for multiple floors, I stacked the walls to the desired height. Next, I spliced a wall cap section for the extended wall then trimmed the foundation to accommodate the wall angles. Finally, I added a roof made from sheet styrene.

10 Paint and details

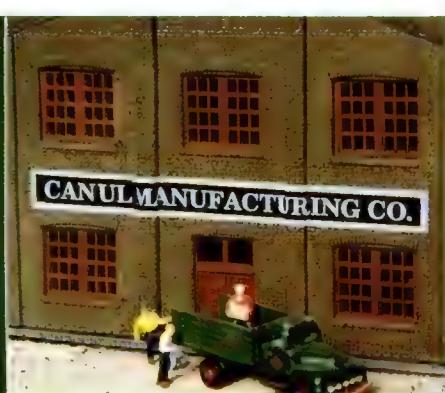


I used Tamiya no. AS-22 Dark Earth spray paint the walls. Next, I added roof details, decals, and chalk weathering. Finally, I mounted the two buildings on $\frac{1}{8}$ " thick model aircraft plywood, which matches the height of the N scale cork roadbed I use on my layout.

Modifying decal sheets



Just as commercial structure kits are ripe for modification, so too are the decal sheets or dry transfer graphics that accompany them. It's easy to swap decals between kits, but with a little work, a sharp hobby knife, a metal straight edge, and decal setting solution, you can create unique signs for your kitbashed structures.



For my American Supply structure, I borrowed the decal from the Walthers' American Hardware Supply and cut out the words "American" and "Supply" from the sheet. The white border around the words made it easy to align the two words on the structure. Using decal setting solution and weathering makes the seam difficult to detect. – R.H.

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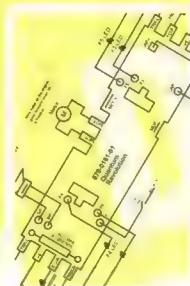
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Across the Alleghenies

On the HO scale Penn Valley, the scenery speaks for itself

By Lou Sassi • Photos by the author



1. A westbound Penn Valley freight on its way to Erie, Pa., crosses above a train on the New York Central main line. David Holl considers scenery to be one of his strong points.



2. Westbound through freight No. 45 heads through the S curve in Black Mountain, Pa. David Holl's HO scale Penn Valley layout is a freelanced bridge line that crosses the Allegheny Mountains in Pennsylvania.

Though David Holl enjoys all aspects of model railroading, he calls scenery his strongest suit. He says he approaches railroad building as the prototype does, adapting the track to the scene rather than the other way around.

"Each scene has a story to tell, whether it's a rural area with rock formations and forests or a detailed city scene with realistic people, cars, and buildings," he says. "Although the hob-

by is called model railroading, I view it as 'model reality.' I establish a scene and then decide how the railroad fits into it."

David has tried to achieve a balance of realistic urban and rural scenery on

his HO scale railroad, the Penn Valley. The layout features a succession of big towns with many scale acres of countryside between them.

David got into model railroading when he was a high school sophomore. An accident put him in a neck brace for six months, and he whiled away the time building HO scale models. Once the brace came off, he built his first layout, following a track plan from *Small Layouts You Can Build* (Kalmbach Books, now out of print). Since then, David has built five layouts, including three previous incarnations of the Penn Valley.

The current Penn Valley represents a bridge route between Allentown and Erie, Pa., connecting the Pennsylvania RR and the New York Central in late 1957. The track plan is David's design, and has a 2 1/2 percent ruling grade that requires helpers on longer trains.

David's favorite scene on the layout is the city of East Eiser. Although it's a fictional location, he tried to make it look like a real place. The scene starts from the left where the outskirts of the city begin with a farm, private homes, a hospital, some factories, and then the downtown. There are more than 20 structures in the downtown area, with plenty of details such as people, vehicles, signs, and streetlights. To the right are the railroad yards, with Union Station dominating the scene. The station hosts three railroads – the Penn Valley, the Pennsy, and the freelanced East Eiser & Rocky Bottom RR. (And if that wasn't enough, elsewhere there are interchanges with the New York Central and the Lehigh Valley.)

Construction

David started preparing his basement for the layout in 1999. He placed a plastic vapor barrier against the outside walls, then installed studs around the entire basement. Next came insulation and wiring.

After he installed the drywall, David painted it sky blue and stenciled clouds with white spray paint.

David began the layout in 2000 with L-girder benchwork. To shape the basic landforms, he wove a web of cardboard strips, which he anchored to the benchwork with staples and hot glue. He protected the floor with plastic drop cloths, then made a hardshell using paper towels soaked in Hydrocal. But as construction on the layout progressed, David changed to plaster-impregnated gauze, which proved to be less messy.

Over this plaster shell, David spread a 1/4"-thick layer of lightweight drywall compound to smooth it and refine its



► The layout at a glance

Name: Penn Valley RR
Scale: HO (1:87.1)
Size: 36 x 46 feet
Theme: Northeastern bridge route
Locale: Pennsylvania
Era: September 1957
Style: walkaround
Mainline run: 230 feet
Minimum turnout: no. 6 (main), no. 4 (yards)
Minimum radius: 18" (staging)
Maximum grade: 2.5 percent
Benchwork: L girder
Height: 36" (staging) to 56"
Roadbed: Homasote on OSB
Track: handlaid, with commercial turnouts; flextrack in staging
Scenery: Plaster cloth and drywall compound on cardboard lattice
Backdrop: drywall
Control: Digitrax Digital Command Control

Penn Valley RR

- HO scale (1:87.1)
- Layout size: 36 x 46 feet
- Scale of plan: $\frac{3}{16}$ " = 1'-0", 24" grid
- Numbered arrows indicate photo locations



Illustration by Rick Johnson



3. Eastbound local freight No. 172 crosses under Main Street Bridge in East Eiser and enters Downing Yard.

shape. While the drywall compound was still wet, he inserted pieces of toothpicks to anchor foliage he would apply later.

Once the hardshell had dried for 24 hours, David sprayed the surface with dark green paint. He then covered the countryside with a variety of ground foam from Woodland Scenics and attached the company's clump foliage to the toothpicks to represent shrubs and tall weeds.

David made rock castings from Hydrocal poured into homemade rubber molds. Once he affixed the rocks into position on the layout, he colored them with diluted acrylic paints.

He made small creeks and runoffs with Enviro-Tex, a two-part resin product. However, he made the water in the large dockside scene in Erie by paint-

Museum presentation

David took a cue from museum dioramas when planning how to show off his Penn Valley layout.

After completing the benchwork, David built a brown fascia along the edge of the layout and a lighting valence above it. The valence follows the path of the fascia below, framing the railroad like a museum display. A brown cloth skirt hung from the bottom of the fascia hides staging tracks and anything else that might distract from the view.

Illumination is from 60 incandescent bulbs, grouped in circuits of 15 bulbs, each circuit with its own dimmer switch. This lets David control lighting in different parts of the layout separately. Also, for night scenes, he strung 800 blue Christmas lights behind the valence.

ing the surface of oriented strand board (OSB) a dark turquoise color, followed by three coats of shellac.

Track and structures

David handlaid all the visible tracks but used flextrack in the tunnels and hidden staging areas for ease of installation. He used commercial turnouts and bridges throughout the layout.

Most of the buildings on the layout are plastic, but a few are wood. About 20 percent of David's structures are kit-bashed. After painting the buildings, he weathered them with pastels and India ink washes.

Most of the residences on the layout have either curtains or blinds in the windows; others are boarded up. This is to keep the buildings from looking like empty shells.

David says that when he works on the layout, he varies his tasks to keep from getting bored. "I would do some scenery, switch to track laying, and then to building structures," he says. "Doing it this way kept me constantly thinking of new things to do. It took the monotony of the different phases of the hobby away."

This technique also kept the project moving. "I didn't want to take 10 to 15 years to build my layout. None of us is getting any younger," he says.

Rolling on the railroad

David's collection of rolling stock is appropriate for the mid- to late-'50s time period he models. Freight cars are mostly from the Pennsylvania, the New



4. A tugboat waits while a PV switcher with an idler flatcar unloads the car float in Erie, Pa. The lake water was made by layering three coats of shellac on a base of oriented-strand board painted turquoise.

one of the RS-3s and two of David's steam engines are sound-equipped.

Operations on the Penn Valley

Two local freights run the length of the Penn Valley each operating session, one traveling east and one west. Each switches only trailing-point industries, simplifying things for the engineers. The freight trains follow a switch list, while the eight passenger trains per session move according to a timetable. By studying Pennsy and NYC timetables from the late 1950s, David was able to plan his own trains' timetables so they can make connections with both of those railroads.

David has used a waybill/car card system for routing freight cars for more than 30 years.

The railroad is controlled by a dispatcher, using orders delivered by radio to direct train movements. Since David uses DCC, the dispatcher controls only the turnouts on the main



5. A pair of Electro-Motive Division FP9s pull Penn Valley passenger train No. 12, the PeeVee Flyer, up to the platform at Allentown's Union Station, where a few passengers are waiting.

David's favorite diesel locomotives are Alco RS-1s and RS-3s for freight work, and Electro-Motive Division FP9s for his passenger trains. Not coincidentally, these diesels are also the favorites of the Penn Valley management. David is gradually adding sound to the layout;

York Central, and of course Penn Valley, with a sprinkling of others mixed in, mostly from the Northeast. The railroad also sports a few unique Pennsy cars, such as K9A and K11 stock cars and X31F "turtle top" box cars.

He weathers the majority of his freight car fleet using an airbrush to lightly spray a very diluted mixture of Grimy Black and gray paints. He further weathers some cars with black, rust, and gray powdered pastels.



6. A hotshot trailer-on-flatcar (TOFC) train crosses Sine Grade Bridge on its way to Erie, Pa., where the New York Central will take the train to its ultimate destination of Chicago.



Meet David Holl

David Holl received his first model train, a Lionel set, as a Christmas present when he was 8 years old. David has been a model railroader ever since, and he is now a life member of the National Model Railroad Association. The current Penn Valley is his fifth layout; a previous version was featured in *Great Model Railroads 1999*.

line; train operators must align those on sidings. A track-detection system allows the dispatcher to monitor train movements from his control panel.

In addition to the dispatcher, other jobs filled during an operating session include the Bay View yardmaster in Erie, Pa., Downing yardmaster in East Eiser, Pa., Allentown yardmaster, and four road crews. David acts as adviser and troubleshooter.

Operating sessions last about three hours and run against an 8:1 fast clock, meaning a session covers 24 hours of layout time. Fifteen trains will run during a typical session.

"For the first couple of sessions, trying to teach eight people how to use DCC throttles, where the towns were, and which train did what job was quite a task," David says. "But as time has progressed my crew now understands the method of my madness. Obviously, there is a learning curve."

Missions accomplished

David says that when he set out to build the Penn Valley, he had two goals in mind: to build a realistic-looking, fun-to-operate railroad, and to use that experience to build friendships with

his fellow hobbyists. He says he has accomplished both.

"I wanted to allow people who didn't have space for a layout of their own to come learn new techniques. I wanted those who had limited space to come work on and operate a layout that could be considered club-size. All they had to do was come to my home, and together we could develop their skills."

He credits his group of friends with making the layout possible. Without them, he says, "this dream layout would still be in the building stage."

As for his other goal, "I wanted realistic scenes, yet something different so visitors would remember my layout for something special. Visitors who have traveled through Pennsylvania have assured me that I've captured the scenery well, so I believe I have accomplished my goals."

"I feel I have planned and built the railroad of my dreams, and now I enjoy sharing it with my friends. That is my real reward." **MR**

Lou Sassi is a railroad modeler, writer and photographer who regularly contributes to the pages of Model Railroadader and Great Model Railroads.

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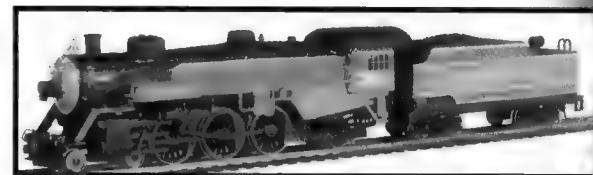
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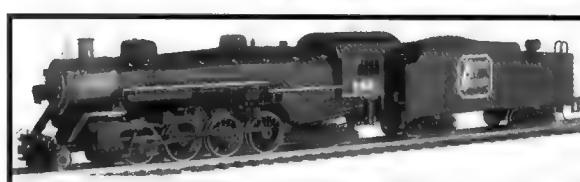


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Kitbash an SD10 Diesel



Easy methods for making a unique, yet accurate addition to your locomotive fleet

By Jim Volhard

Photos by the author

One of my favorite parts of any model railroad project is historical research. After finding information about the Milwaukee Road's SD10 fleet, I wanted to model this unusual diesel locomotive in HO scale. You'll find my techniques helpful for modeling your own SD10 or another unusual prototype diesel.

Origin of the SD10

By the early 1970s, many of the Milwaukee Road's first-generation diesels were wearing out, including its aging fleet of General Motors Electro-Motive Division SD7s and SD9s. At that time these six-axle locomotives prowled the railroad's secondary lines. The financially strapped railroad couldn't afford

new power, so it began to rebuild some of these units in March of 1974.

The prototype's modifications

Internally, the units received new wiring and brake upgrades. The SD10s were also upgraded with new 1,800-hp model 645 engines.

External modifications included a chopped nose and a large paper air filter housing. The underframe air tanks also were remounted.

A total of 17 SD7s and four SD9s had been rebuilt into SD10 locomotives when the Milwaukee Road ended the rebuild program in January 1976. See **fig. 1** for a prototype photo.

The Soo Line took over the Milwaukee Road in 1986 and at the end of that year sold 17 of the units to the Dakota, Minnesota & Eastern.

Modifying the underframe

Life-Like's Proto 2000 SD7 without dynamic brakes provides the best starting point for modeling an SD10.

For a Milwaukee Road unit, the first step is to remove the front half of the fuel tank. Before making any modification, you should strip the running gear and motor from the frame to avoid getting metal filings in them.

Intrigued by the SD10's history, Jim Volhard undertook an ambitious project to model one of these unusual rebuilt locomotives.

First, remove the front half of the tank and saw off the coupler mounting brackets flush with the bottom of the frame. Next, file a notch into each end of the frame up to the raised screw threads to clear new body-mounted couplers. Clean up the saw marks with a mill file.

With the front half of the tank removed, you must stabilize the motor housing. Start by cutting off the front half of the rubber motor mounts, then epoxy a $1/2"$ piece of $.080" \times .080"$ styrene strip on each side of the motor well.

The air tanks need to be repositioned to follow the prototype. Trim the mounting brackets on the tanks to match the tanks' straps. Cut a $3/8"$ notch into the top of the tanks to clear the front of the motor's frame, and then remount the tanks $3/4"$ in front of the remaining fuel tank casting. See **fig. 2**.

To lower the air tanks, epoxy a $1/2"$ length of HO scale 2×8 styrene strip to each side of the bottom of the frame. After the epoxy dries, cement the tanks to the strips. Do not remove the pipe between the tanks on the left side.

For the right side of the tank, cement a .020" styrene sheet to the rear of the fuel tank. Then trim the sheet's sides flush with the edge of the tank and the top of the motor frame.

Fashion four Z-shaped hooks from Detail Associates .010" x .030" flat brass wire to make hangers for the rerail frogs. Epoxy the hooks to the frame between the fuel and air tanks, as shown in **fig. 2**. The frogs will be added at final assembly.

Next, add the base of the speed recorder to the rear journal on the front right truck. Drill out the journal and install the base. The rest of the speed recorder will be added later.

To accommodate the lowered short hood, you can use a file or motor tool to grind down the top of the front weight, as shown in **fig. 3**.

Adjusting the body

First, disassemble the body shell with cyanoacrylate adhesive (CA) debonder. Use the exploded-view diagrams in the instruction sheet to determine which pieces come apart.

The short hood must be lowered a scale 3'-6", as shown in **fig. 4** on page 68. Cut a strip of masking tape to that size and position its top edge to just below the bottom of the hood curve. Use the tip of a sharp no. 11 hobby knife blade and lightly score the edge of the hood. Peel off the tape, then remove the material up to the scored line. Cement the top of the hood onto the body, fill any gaps, and file the seams. Finish the lowered hood by sanding off all traces of hood doors on the sides.

Next, add classification lights to the upper outside corners of the lowered nose. Detail Associates sells EMD classification lights that would work.

Drill a hole in the correct location and secure the class lights from the inside with liquid plastic cement. Once the classification lights are secure, drill a .025" hole through each one for later lens installation, then add the original sand filler hatch.

Only the ladder on the right side is needed. Remove the top rung as well as the side rails down to the top of the second rung. Then carefully remove the mounting brackets from the unused portion of the ladder. Position the shortened ladder on the shell and secure it using the bottom mounting pins.

The salvaged brackets will be repositioned halfway between the top two rungs. Mark and drill no. 78 holes for the mounting pins. The inside of the brackets should just touch the outside of the ladder rails. Secure the brackets



Fig. 1 The prototype. The Soo Line purchased the Milwaukee Road in 1986 and in that same year sold 17 SD10 diesels to the Dakota, Minnesota & Eastern. This 1986 photo shows ex-MILW no. 556 on the DM&E at Waseca, Minn.

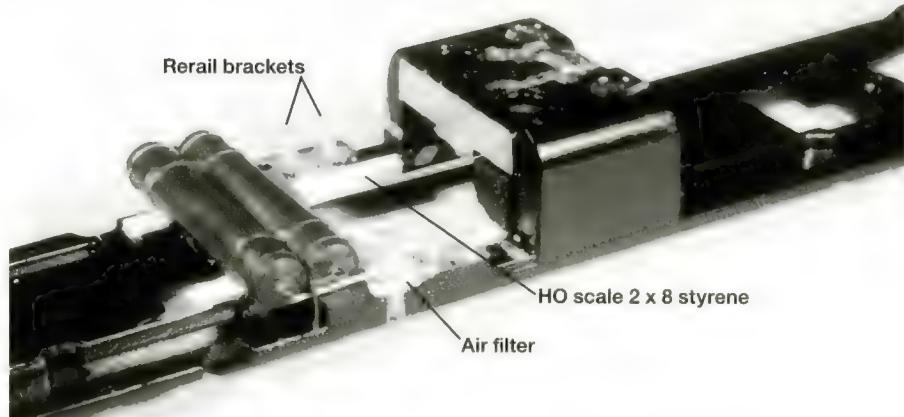


Fig. 2 Modified frame. The front half of the fuel tank has been removed, and the air tanks have been mounted in a new position. The detailing is completed with an air filter, piping, and Z-shaped brackets to mount the rerail frog.

from the inside with CA and remove the ladder. It will be cemented in place during final assembly.

Detailing the cab

Cab modifications (shown in **fig. 5**) include adding number boards and headlight assemblies as well as a new standard EMD windshield from a Cannon cab kit. Before installation, trim the windshield so that the top edges are even with the cab opening.

Hang the new number board from the alignment pins on the front of the cab and cement it in place. The top corners should extend slightly above the rounded roof. Once the cement dries, slice off the pins and fit small triangles of .010" styrene sheet behind the corners of the number board.

Drill holes for the windshield wipers, horn, rotary beacon, and headlights, but don't install these parts or the all-weather window on the right side of the cab just yet.

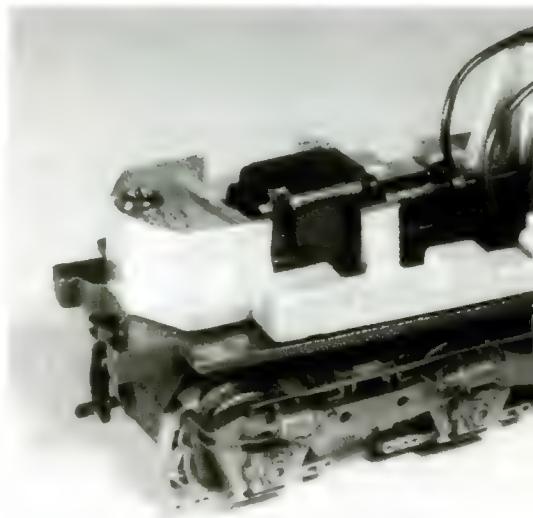


Fig. 3 Trimmed weight. Jim trimmed the top of the front weight so the lowered short hood would fit. He also removed the factory-installed coupler mounting brackets.

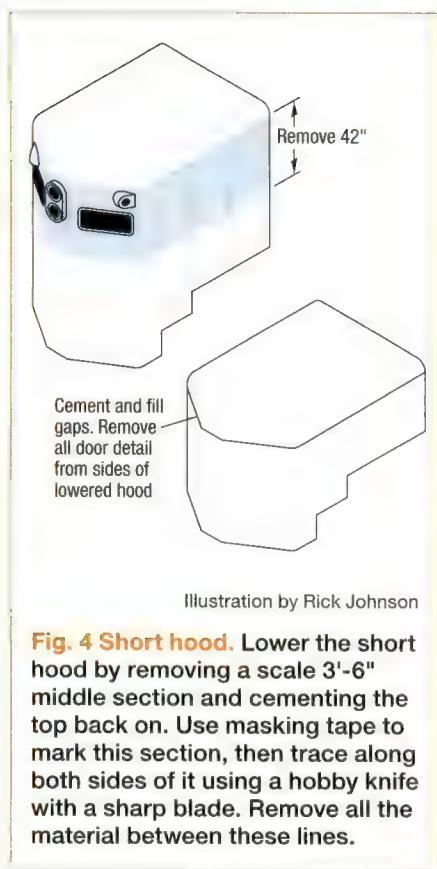


Fig. 4 Short hood. Lower the short hood by removing a scale 3'-6" middle section and cementing the top back on. Use masking tape to mark this section, then trace along both sides of it using a hobby knife with a sharp blade. Remove all the material between these lines.

Since the front headlight is moved to the roof of the cab, you'll need to conceal the wire that connects the headlight bulb. Apply CA to the wire for added stiffness then bend the wire so that it rests up inside the cab roof.

To prevent the cab from being lit, use CA to attach a 1" length of $\frac{3}{16}$ " brass tubing to the underside of the cab roof. This prevents one end of the bulb from butting against the inside of the number board. When the body is installed, the bulb will slide into the tube.

Modeling the long hood

The most prominent detail on these units is the air filter intake housing. The Milwaukee Road used two types, one of which is the rectangular Horst filter that I modeled.

Detail Associates makes the correct Horst filter, however it needs some extra work for this project. Start by narrowing the center filter body to a scale 6" before attaching the weather hoods. You can square the body using a mill file and replace the cast-on plate filter with a similar-sized sheet of styrene to improve the appearance of the finished hood, as shown in **fig. 6**. Set the hood aside as it isn't added until after painting.

Two sets of molded access doors need to be lowered to accommodate the Horst filter. Use a no. 17 chisel blade to scrape the top portion of the doors

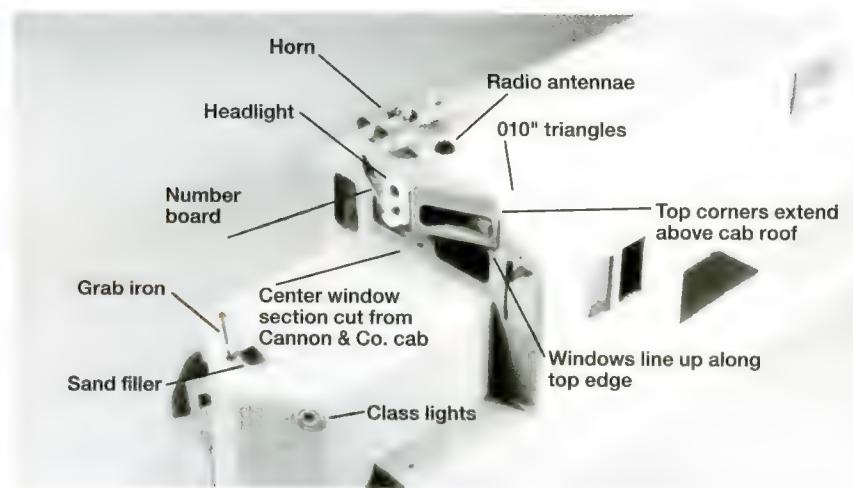


Fig. 5 Cab modifications. Jim cut the center window section from a Cannon cab and added it to the model. He then cemented the number board/headlight assembly to the front of the cab. Jim also drilled the roof beacon mounting hole, but the beacon wasn't installed until after painting.

flush with the hood surface. (Use a metal straightedge as a guide so you don't remove too much of the door.) Then sand the area smooth.

Cut new hood latches from Cannon & Co. doors and cement the latches in place. These latches should be slightly higher than the surrounding door surface, as shown in **fig. 7**.

Make new hinges from HO scale 1 x 2 styrene. Use two pieces in each hinge location to match the look of the cast-on hinge details. Once the hood doors are lowered and detailed, install the cover plates using CA.

Remove the cast-on exhaust stacks on top of the long hood and replace them with four new stacks. Two of the new stacks are in the same location, while the other two are located between them. Plug the unused holes on the roof with pieces of styrene.

Use a no. 17 chisel blade to remove the rear headlight housing. You can then cement the new Detail Associates headlight in place.

On the prototype, a winterization hatch covers the front radiator fan. Details West makes an accurate winterization hatch that fits this model. For my SD10, I scraped off that part's cast-in screen and added an etched screen that I had left over from another project. You can see the exhaust stacks and winterization hatch in **fig. 8**.

Couplers and pilots

Body-mounted couplers improve the look and operation of the model. Once the old coupler brackets are removed, build up two new coupler-mounting pads using stacks of six $.040"$ Evergreen $\frac{1}{4}$ " tiles. Trim $\frac{3}{32}$ " from one end of each tile then cement them together.

Assemble the Kadee couplers. Use the longer shank no. 5 coupler for the front assembly to clear the snowplow. To locate the mounting hole, position the coupler box evenly with the front edge of the pilot extension and mark the hole location on the mounting pad. Drill a no. 50 hole and tap it for a 2-56 screw. Don't install the couplers until final assembly.

Remove the front and rear drop steps and fill the large notch in the top of the pilots with a $.100" \times .100"$ styrene strip. Also replace the chain from the middle of the front and rear railings with $.022"$ brass wire.

The front m.u. plug needs to be moved from the left to the right side of the pilot, but don't add footboards to either pilot. Drill mounting holes for the snowplow on the front pilot shown in **fig. 9** on page 70, but don't attach the plow until after painting. Next add a $.020"$ styrene extension to the rear pilot as illustrated in **fig. 10**.

Plug all mounting holes for the m.u. hose clusters, air hoses, uncoupling levers, and grab irons. At some point, new uncoupling levers with an upper loop were added to the prototype. You can mount the levers on the model with wire eye-bolts.

I added poling pockets by cementing Cannon & Co. 2051 EMD pilot lift tabs. I also added other details to the rear pilot, as shown in **fig. 10**. You can drill holes for the new m.u. hose clusters and brake hose, but leave these parts off for now.

Next extend the second and third pilot steps. An HO scale 1 x 6 styrene strip can be used for the second from the top step, and a 1 x 3 strip for the third step. Trim each strip to fit.

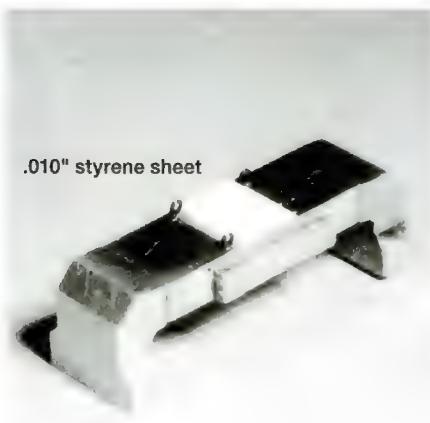


Fig. 6 Horst filter. Jim squared off the metal filter hood and removed its cast-on filter detail in the cleanup process. He then replaced it with a similar-sized piece of styrene sheet.

Painting the locomotive

I used Scalecoat paints to replicate the Milwaukee Road paint scheme on my SD10.

I recommend adding a primer coat of Floquil Primer mixed 50/50 with lacquer thinner. This not only adds an even-colored base for subsequent paint applications, it also allows you to spot any flaws in your work so that you can make corrections before applying the finish color. Let the primer coat dry for several days before adding the middle orange band.

My model represents a unit that has been exposed to the elements for over a decade, so the orange paint should be quite faded. I accounted for the color fading by adding 20 percent white to the orange.

Airbrush the orange band with a 75/25 paint-to-thinner mix. Make sure the color extends beyond the eventual color separation lines. Allow a few days for drying.

Next mask everything that will remain orange so the black can be applied. The orange should extend from the top of the walkway in a scale 4'-6"-high band. The only parts not orange in the band are the top of the battery box covers, which are painted black.

After everything is properly masked, spray the exposed cab area, trucks, underframe, number boards, and other miscellaneous parts black. I added 10 percent white to the black paint for a faded appearance. Remove the masking and let the parts dry for several days. You can use a small brush to touch up any problem areas.

You'll need to brush-paint several detail parts. Paint the windshield wipers and rear class lights silver. Use

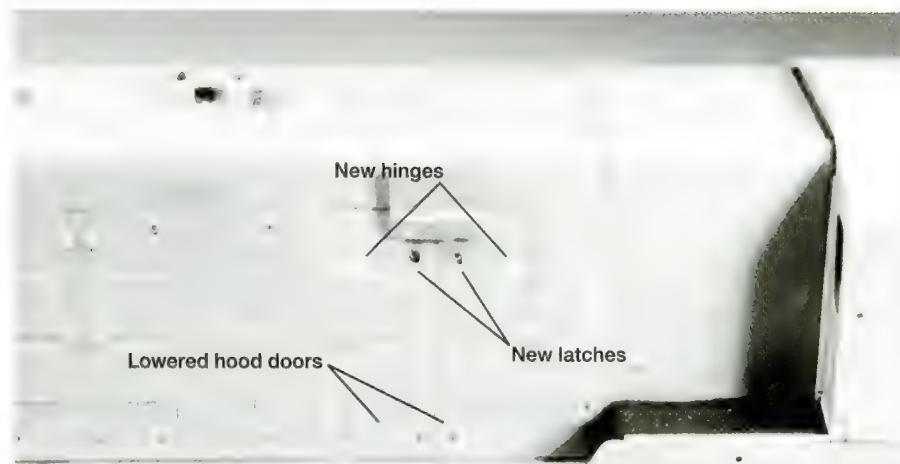


Fig. 7 Long hood details. Modifications for installing the Horst filter include lowering a set of access doors and adding new hinges and latches.

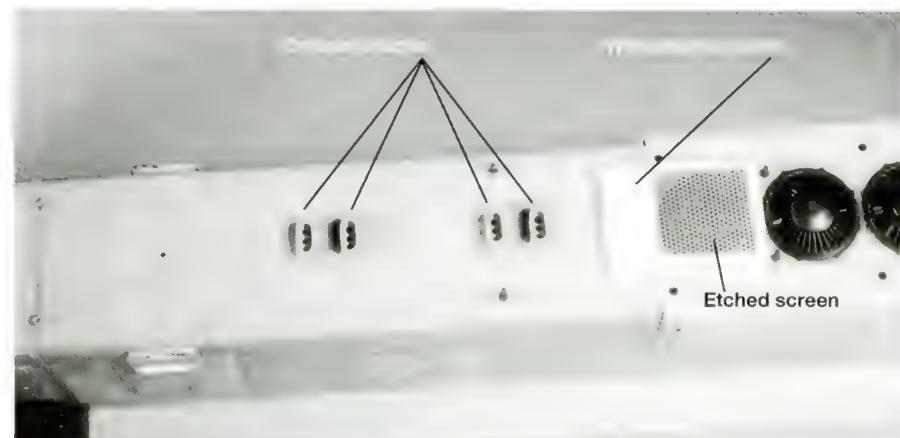


Fig. 8 Top view. Jim added four new exhaust stacks as well as a winterization hatch to the long hood. He also added an etched-metal screen to the hatch.

white for the step well handrails, the uncoupling levers, and the grab irons above the plow on the rear pilot.

I painted several of the hood latches CSX Tan to represent those that had been replaced. Finish by painting any other details that are unique to the particular unit you're modeling.

Next add decals to the model using Microscale Milwaukee Road diesel set 87-789 and MP Locomotive set 87-74 for the number board numerals. Follow photos of your prototype to accurately position the decals. I recommend using Microscale Micro-Sol decal setting solution. Make sure not to touch any of the decals until they're completely dry.

Wait at least a day, then seal the decals with several light coats of Testor's Dullcote. This gives the entire unit a flat, even finish for weathering.

Prototypical weathering effects

It's always best to work from a prototype photo similar to your model unit to get realistic weathering effects. I didn't have a photo of the 548, but

instead used one of another SD10 taken in 1986 as a guide for my weathering.

In 1986 the SD10 still looked good. The Milwaukee Road orange paint had faded somewhat, but the rebuilt diesel had stayed quite clean. The most noticeable weathering effects were below the walkways. The frame, pilots, trucks, and fuel tank had a moderate amount of lightly colored road grime. The truck journals were rather dark from bearing grease, and the fuel tank showed streaks of spilled diesel fuel.

The primary weathering color that I used was Floquil Dust. Mixing 90 percent thinner and 10 percent paint, I airbrushed the entire model with several light coats. I gave the area below the walkways a few more light coats, concentrating on the truck sideframes, fuel tank, and air tanks. These areas should be considerably lightened.

While painting with such a thin mix may seem like a slow process, be patient. The resulting subtle weathering effects make a more realistic model, and building up thin coats helps you avoid trouble.

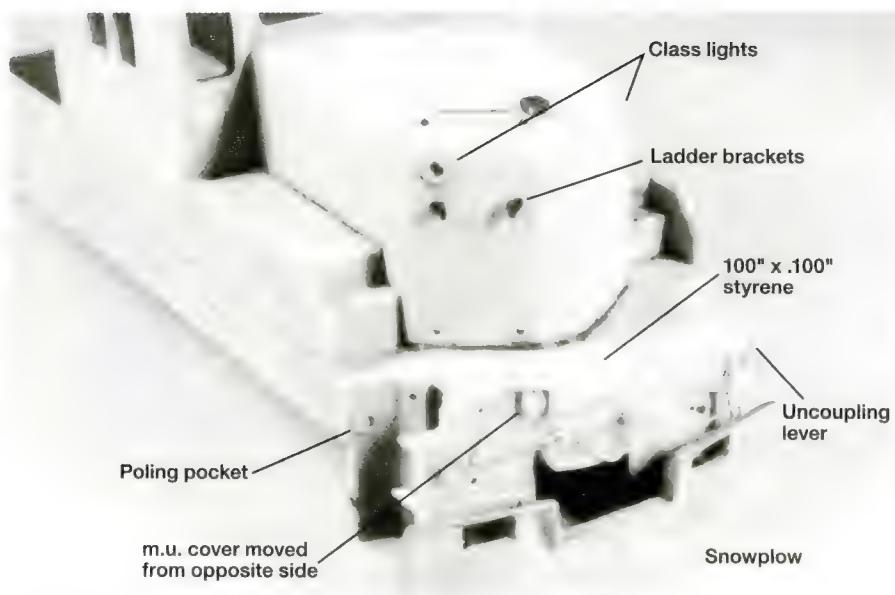


Fig. 9 Front of the unit. Place the details on the front of the diesel as shown, using liquid plastic cement or cyanoacrylate adhesive.

► Materials list

A-Line

29201 short wipers

Cannon & Co.

1501 EMD SD50/60/70 cab

Detail Associates

1006 Mars dual-beam headlight
1019 diesel class lights
1024 Pyle dual headlight (vertical)
1802 radio antenna (whip type)
2206 wire eyebolts (lift rings)
2212 uncoupling lever
2301 all-weather cab window
2402 exhaust stacks
2507 .022" round brass wire
2524 .015" x .030" flat brass wire
2707 Horst paper-type air filter
2807 flange-type speed recorder
7103 rerail frogs

Details West

106 rotary beacon
120 snowplow
164 EMD GP/SD winterization hatch
190 Leslie RSL-3L-R air horn
198 prime type-1 air filter
266 m.u. hoses (three cluster)
267 air hose with bracket
268 air hose with extension

Evergreen styrene

164 .080" x .080"
175 .100" x .100"
254 1/4" square tube

14505 1/4" square tiles

8102 HO scale 1 x 2
8103 HO scale 1 x 3
8106 HO scale 1 x 6
8208 HO scale 2 x 8
9005 .005" clear sheet
9010 .010" sheet
9020 .020" sheet

Floquil

110006 Dust
110009 Primer
110010 Engine Black

Kadee

5 coupler
33 short-shank centered coupler

Life-Like

SD7 without dynamic brake

Microscale

8774 MP hood unit diesels
87789 Milwaukee diesels 1960-87

Scalecoat

10102 black
10112 white
10832 Milwaukee Orange

Testors

1160 Dullcote

Wm. K. Walthers

1032 2-56 3/16" screws

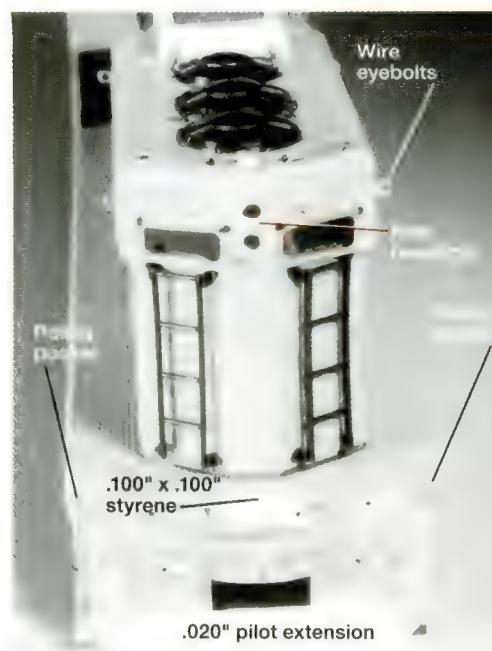


Fig. 10 Rear pilot. These details can be added prior to painting.

Drybrush Floquil Engine Black on the truck journals and fuel tank. Then airbrush several light coats of 50/50 Dullcote and lacquer thinner mix.

Adding the final details

After painting you can install the couplers on the mounting pads with 2-56 screws. Check the couplers with a coupler height gauge. Adjust the couplers if necessary.

Use CA to install grab irons, speed recorder parts, and other details. You can also add the window glazing, headlight lenses, and class lights.

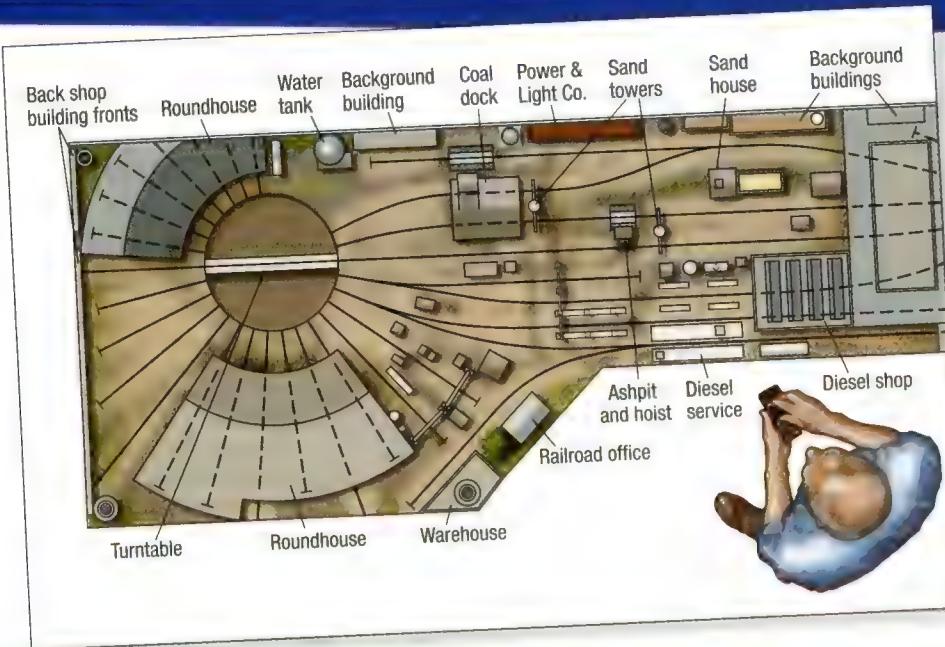
For the most of the cab windows, cut .005" clear styrene following the instructions from the cab kit and secure the glazing with liquid cement. You'll also need to cut a piece of styrene to fit the all-weather window. Use Microscale Krystal Kleer to make the small end panes on the all-weather window.

I melted fiber optic strands (.040" for headlights, .020" for class lights) into rounds to make lenses for my SD10. You could also use Krystal Kleer.

Finally, snap the body in place and set your unit on the rails and take her for a test run. The SD10 is a unique diesel built by a fallen flag railroad. Even if you don't model the Milwaukee Road, Soo Line, or DM&E, you can adapt some of these techniques to model your favorite oddball prototype. **MR**

Jim Volhard has written several painting and kitbashing articles for Model Railroader. He lives in Mosinee, Wis.

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1. Each entry must be an original work and include a scale layout plan and a written description. The plan can be of your own layout or of a layout you might wish to build some day. Other criteria are:

A. The scale layout plan must be drawn to $\frac{3}{4}'' = 1'-0''$ scale.

B. The plan can be for any scale or gauge (most common scales are Z, N, HO, S, O, and G) using standard or narrow gauge track, and must fit within a 200-square-foot floor space. Layouts smaller than 200 square feet are eligible. The layout can be rectangular or an irregular shape, free-standing or positioned against a wall or walls. The layout can be walk-around style, walk-in style, shelf style, or any other variation. The ceiling height is 8 feet. Interior aisles, all walkways around the outer edges of the layout necessary for operation, and access openings in the surface of the layout all count toward the 200-square-foot maximum.

C. The following features must be indicated on the layout plan: all track, structures, scenic features, track elevations, turnout sizes, curve radii, and placement of room walls and sizes of aisles and access openings, when applicable.

D. The finished plan should be drawn for commercial turnouts (please specify brand, model or item number, and size) and be submitted neatly drawn in pencil or ink, or as a computer printout. Coloring media, such as

marking pens, colored pencils, or watercolor paints, may be used. Plans drawn using software illustration programs will be accepted only in printed-paper form. Electronic submissions will not be accepted.

E. A written description must accompany the plan. The text must be printed from a computer or typed, double spaced, and 1,000 to 2,000 words long. Include an electronic version of your text on a CD if possible. The topics covered in the text might (but not necessarily) include the following: planning goals, prototype influence (if any), special features, construction or design techniques to solve unusual problems, operating concept, control system, period or place represented, and scenic features.

F. A brief biography and photo of the entrant are also required.

2. Extra explanatory illustrations, such as schematic diagrams, maps, grade profiles, and cutaway views may be included.

3. Each contestant is limited to one entry.

4. All entries must be received in *Model Railroader*'s offices no later than October 31, 2008.

5. Winning entries will be published beginning in the May 2009 issue. The first-prize winner is awarded \$1,000, second-prize winner is awarded \$500, and third-prize

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6. All winning entries become the property of *Model Railroader* magazine.

7. *Model Railroader* reserves the right to purchase any non-winning entries at our standard rate for future publication.

8. Non-winning entries not selected for purchase will be returned only if appropriate packaging and postage are supplied by the entrant at time of submission.

9. Kirschbaum Publishing Co. employees and members of their immediate families are not eligible to enter this contest.

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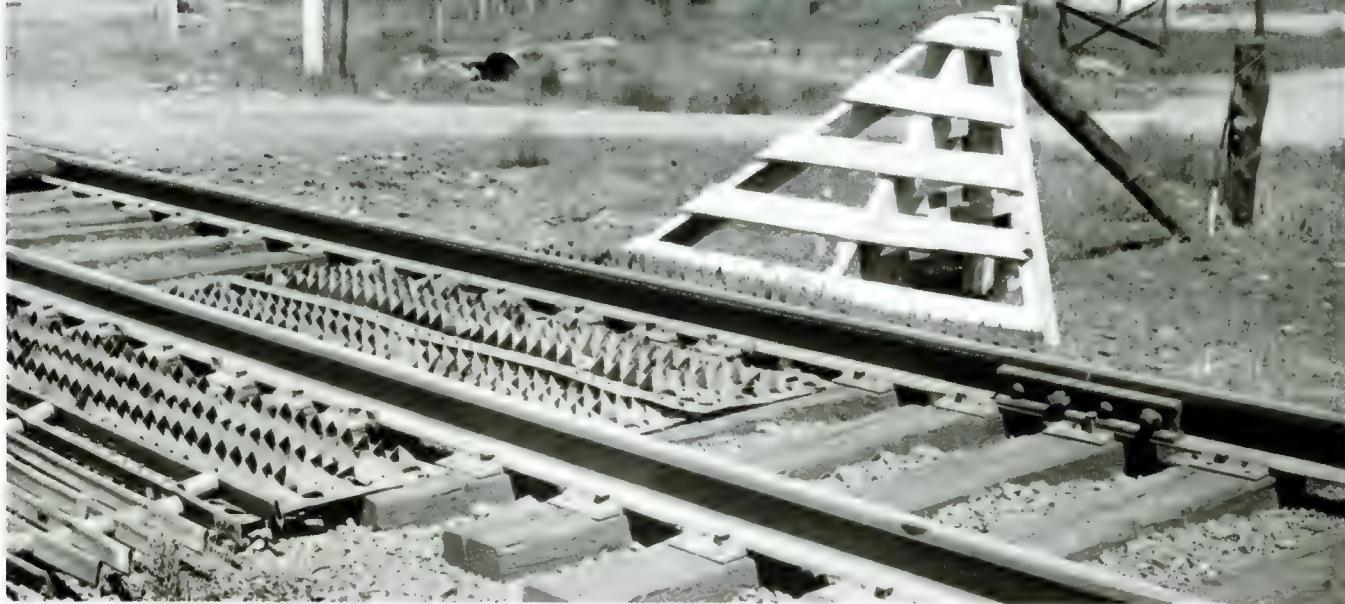
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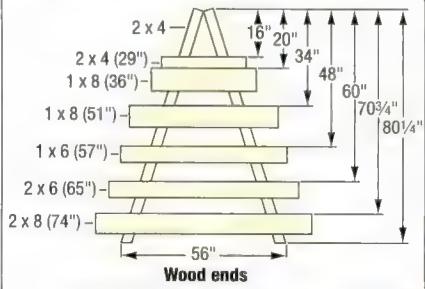
Model a cattle guard

Plans for a simple scratchbuilding project

By Harold W. Russell

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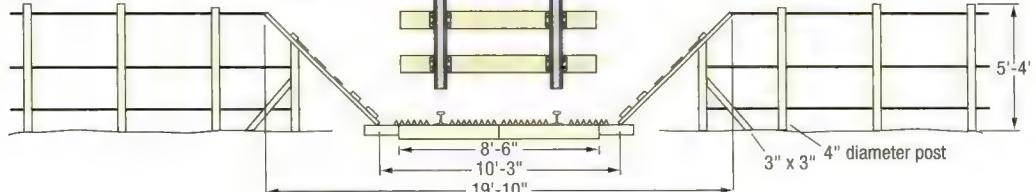


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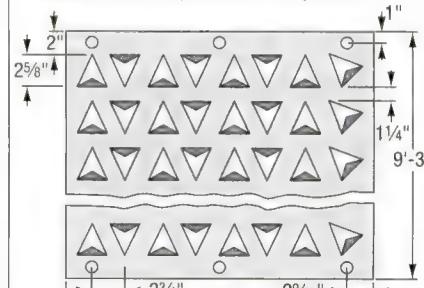
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Cattle guards, such as this one on the Denver & Rio Grande Western, kept livestock from wandering onto the tracks. Glenn Wagner photo

laid next to and between the rails. These spikes are painful when stepped on by livestock and prevent them from crossing the tracks.

Use what's available

The design shown here, located on the Arcade & Attica RR in New York state, was apparently assembled with random pieces of wood. You can vary the dimensions to suit your needs. The wood pattern of the two sloping portions can be different, and the slats need not be horizontal. The angle of the sloping portion can be varied based on the height of the adjacent fence.

The spiked metal plates were obtained from a railroad hardware supplier and are made particularly for this purpose. The prototype has v-shaped holes punched in rows into sheet metal. The triangular spike is bent up along one edge at an angle of about 75 degrees. Notice that the direction of the spikes alternates, and they are turned 45 degrees in one outside row.

For modeling purposes, the plates could be made of heavy aluminum foil. A sharp needle can be used to make circular punches, but a special punch would have to be made to obtain the triangular pattern.

Though holes are provided for bolting the plates to the ties, the plates were just set in place.

A simple project

This cattle guard could be a first scratchbuilding project, and can be finished in one evening. The wood can be obtained from a scrap box. You may want to distress it with steel wool since finished lumber wouldn't be used in this application.

The wood of the prototype is weathered to a gray color. Simulate this with a wash of light gray paint. Use several shades for variety and realism. The perforated plates are a dark rust color. Floquil Rail Brown mixed with black would approximate the color.

When placing the model on your layout, be sure to add suitable foliage growing up around the fence and through the plate's perforations. **MR**

Harold W. Russell has contributed illustrations and articles to Model Railroader magazine since the 1960s. His drawings of the Morristown & Erie's water tower in Whippany, N.J., were published in the March 2008 issue.

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Bob Hayden's Carrabassett & Dead River

An innovative New England narrow gauge line that feels just right

By Jim Kelly • Photos by Dave Frary and Bob Hayden



There was no mistaking the locale of Bob Hayden's HO $\frac{1}{2}$ Carrabasset & Dead River Ry. for anywhere but coastal New England. Bob loves to scratchbuild, and he explained how he modeled the swaybacked timbers of the Smith Bros. Fish Co. in the November 1992 *Model Railroader*.



Bob built "what if" diesels (such as no. 34 shown here) for his narrow gauge line, which he declared had survived into the 1940s, years after the real Maine two-footers were gone. The lobster boat has extra meaning – Bob's long-time hobby partner Dave Frary is a lobsterman.

Looking at Bob Hayden's Carrabasset & Dead River Ry., whether in photos or in person, I was always struck by its balance. The trains, scenery, structures – all the elements seemed to fit together perfectly. This rightness of things was no accident.

Bob's plans go far beyond paper and ink. He makes study models, starting with scale wood benchwork and working up to modeling clay scenery. He often makes cardboard mockups of his structures to study how they'll look together. Bob thinks about how others will see the layout and plans lines-of-sight to guide the visitor's eye. Detailed scenes are separated by neutral areas the eye skips over.

The Frary connection

Bob designed the Carrabasset & Dead River to be photographed, and not just by anyone, but by his friend Dave Frary. For those of us who have



A diminutive Forney locomotive pulls a passenger train across a high bridge over the Carrabasset River. The spindly steel bridge was inspired by Lobato Trestle on the Cumbres & Toltec Scenic Ry.

been in this hobby since the early 1970s the names Frary and Hayden go together like Simon and Garfunkel. Bob was 14 when he met Dave, and they have collaborated and connived on projects ever since.

Both Bob and Dave are incorrigible theorists, innovative, and have strong independent streaks, so it seems only natural they'd invent their own hobby within the hobby. They are ardent students of the Maine two-foot gauge rail-

roads, have explored practically every inch of those old rights-of-way, and accumulated thousands of photos.

When it came to modeling, though, they used that knowledge not as a destination, but as a departure point. The C&DR is a "what-if" railroad. What if the C&DR had been more prosperous (way more) than its real-life counterparts, embraced the diesel locomotive, and survived into the 1940s?

When N scale first appeared in the late 1960s, Bob and Dave realized its track could be combined with HO scale equipment to get a narrow gauge railroad up and running quickly on 2½ foot gauge track. They could put scratchbuilt HO cabs on N scale diesel bodies to make convincing HOn2½ diesels, even though such engines never existed. Using N scale trucks and couplers resolved the most difficult hardware issues.

Although the C&DR's track is N gauge it didn't use commercial N scale track as Bob had done earlier. Instead, the C&DR is handlaid, some of it courtesy of *Model Railroader* executive editor Andy Sperandeo, who loves tracklaying.

Craftsmanship

Bob is a superb craftsman, and he enjoys scratchbuilding equipment and structures, but doesn't suffer tedium well. He will use commercial castings rather than scratchbuild windows and doors, yet if nothing available is close enough, he will make his own. The Carrabasset roundhouse needed doors that matched a particular prototype. So, Bob built a pattern, made an RTV mold, and cast copies in resin.

Bob keeps careful notes on nearly everything he does. His notes help him recall a technique or re-create an effect from years back. This is particularly important with paint colors and weathering methods.

The C&DR is a sunlit world of vivid colors, yet Bob weathers everything. His secret is simple. Don't overdo it. Particularly effective is his drybrushing. Bob drybrushes details with white to suggest sunlight, especially on structures and rock surfaces.



Bob built the town of Lower Kennebepcport on a slope overlooking the bay. The town and its complex trackwork were part of a challenging switching puzzle Bob created for the December 1996 issue of *Model Railroader*.

Innovation

Bob and Dave didn't necessarily invent all the new techniques and materials they used, but they tended always to refine and perfect them. Among their accomplishments:

- They were among the first to make foam scenery.
- When they wanted to forest their hills with lichen but couldn't find a commercial brand with natural colors, they went into the Maine woods and harvested and processed their own.
- They were using ground foam for ground cover very early, purchasing it from architectural modeling suppliers.
- It wouldn't occur to most modelers to paint structures with model railroad weathering colors such as Mud, Foundation, and Earth, but it did to them.
- When Bob wanted more pulling power without adding a second locomotive, he built a powered boxcar.

• Bob used headphone plugs as pivots for his turntables. The plugs also provide power for the tracks.

The final appeal

Most of us are not going to end up modeling Maine two-foot railroads in HOn2½, but that's not what it was all about. The C&DR was about approaching the hobby creatively, artistically, and as individuals.

The scenes tickled our imaginations, yet they were simple and restrained and offered suggestions we could all use to make our layouts better. **MR**

Jim Kelly is a retired Model Railroader managing editor.

More on our Web site

For a track plan of Bob Hayden's Carrabasset & Dead River Ry., visit our Web site at www.ModelRailroader.com

Landmark layout at a glance

Name: Carrabasset & Dead River Ry.
Scale: HOn2½ (1:87.1)
Size: 28 x 28 feet
Builder: Bob Hayden
First in MR: *Great Model Railroads*
1991

Add sound to an Athearn Genesis F3



Mike Polsgrove shows you how to add a DCC sound decoder to this model. Jim Forbes photos

After reading the title, you might be thinking, "Wait! Athearn offers its Genesis series F units with sound already. Why would you need to do this?" Well, the Soo Line F3 I have is a direct-current model, so I had to add Digital Command Control (DCC) sound decoder myself.

I used the SoundTraxx DSD-AT100LC decoder because it drops right in the Athearn Genesis F units. Model 820040 has its sound programmed for first generation Electro-Motive Division locomotives. SoundTraxx just announced the new Tsunami TSU-1000 decoder with sound and lighting effects. QSI Solutions also recently released a sound decoder for Athearn and Atlas locomotives with downloadable sound. (Neither were available when I started the project.)

The decoder installation is pretty straightforward. I removed the shell by unscrewing the front coupler box and gently prying the fuel tank skirting apart with my fingers. The locomotive has a light board that is replaced with the decoder. The decoder is the same size and shape as the light board and the wires that are connected to the board are attached to the same terminals on the decoder.

The light board wiring is kept in place by plastic caps, but I prefer discarding the caps and soldering all the connections for greater reliability. See **fig. 1**.

The track power is connected to the decoder in four locations, two wires for each rail. One wire is in each corner. The right rail was connected by two wires to the right

side of the decoder, one wire on each end, and the left rail was connected to the left side of the decoder, again, one wire on each end. The red and black wires from the motor are twisted tightly together, as shown in **fig. 2**, so I noted which wire goes on which terminal of the original light board and duplicated that on the decoder so the locomotive didn't run backwards.

After connecting the motor and the track power, it's an ideal time to test the installation by placing the locomotive on a programming track of a DCC system and reading back the decoder's short address, configuration variable (CV) 1. The programming track senses current pulses or "acknowledgments" to the motor during read back, so don't try to read any CVs before connecting the motor because it won't work.

If CV1 reads correctly (out of the box, decoders are supposed to be programmed to address 3), it's safe to attempt running the model on the main line. If the locomotive runs the reverse direction from what the throttle indicates, the motor wires are connected backwards. They can either be switched, or the value of CV29 can be changed to operate the motor in reverse. To change the motor's direction, read back the current value of CV29, add 1 to it, and write the new value back to CV29.

The larger the speaker the better the sound, so I put the largest

speaker (8Ω) I could fit into the rear of the locomotive behind the decoder. A speaker enclosure is an absolute must when installing sound decoders. The TDS small oval speaker and enclosure from Tony's Train Exchange fit in that space perfectly, but there are many speakers and enclosures available from a variety of sources.

I drilled a small hole in the speaker enclosure, routed the purple wires included with the decoder through the hole and soldered them onto the speaker tabs. I soldered one of the speaker wires to one of the speaker connections toward the rear of the decoder. I soldered the other wire to the capacitor included with the decoder. The other lead of the capacitor is connected to the other speaker connection on the decoder. It doesn't matter if it is the + or - terminal on the decoder. I covered all connections with heat shrink tubing. See **fig. 3**.

My model has single-chime air horns, so I reprogrammed the decoder for this type of horn by changing CV115 to a value of 0. I also turned up the volume of the exhaust by programming CV122 to 250. This is a matter of personal taste. Configuration Variable 122 will accept any number between 0 and 255. The larger the number, the louder the sound.

The Soo Line version of the Athearn Genesis F3 has a white headlight in the lower position on the front of the locomotive and a red signal light in the upper

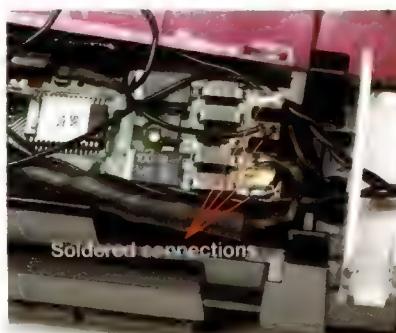


Fig. 1 Soldering the connections. Though the light board wiring was held in place with plastic caps, Mike removed them and soldered the connections for greater reliability.

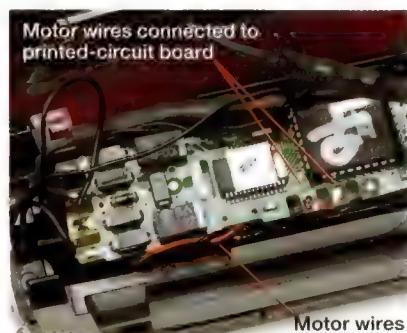


Fig. 2 Motor wires. Mike noted which wire went to which terminal on the original light board and attached the motor wires to the same locations on the decoder.

ATHEARN G2532 NP F-3 A/B Genesis	208
94020/21 NP RS-3m in 2 nos.	69
BACHMANN 82713 NP SD-45 with DCC	79
KATO 37-031, 32 C&NW GP-35, 2 nos.	94
PROTO 1000 23889, 90 C&NW Erie Bilt A 2# 49	49
NP RS-11, in 2 nos.	52
PROTO 2000 40531, 32 C&NW E-7A, 2 nos..	94
30954 D&RGW PA/PB set	135
30954 D&RGW PA unit	75
30203, 4 GN FA A/B set, 2 nos.	135
30527, 8 BN GP-18, in 2 nos.	99
21514, 5 BN GP-30, in 2 nos.	75
23077 BN GP-30 phase II	63
23480, 1 BN SD-60, in 2 nos.	85
30756 BNSF GP38-2	99
30565 BNSF GP-60 yellow war.	99
23557, 9 CB&Q GP-7 Ph 1 2 nos.	75
31480 CB&Q GP-20, new run	124
8124 CB&Q GP-20	71
30142, 3 CB&Q SD-7, in 2 nos.	75
23483 C&NW SD-60	85
23562 MP GP-7	75
21156 MP SW-9/1200	59
31719 ROCK ISLAND E-8A	64
30802, 3 RI E-8 A/B set, in 2 nos.	139
23449 ROCK ISLAND FA-1/FP-1	135
30068, 9 ROCK SW8/900/600 2#	82
21084 SAL E-7A	69
21670 SSW PA ('Daylight')	75
30802, 3 UP E8/9 A?B, in 2 nos.	143
23621,2 UP GP-9 Ph II, in 2 nos.	75

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position. These are powered by the front and rear function outputs of the decoder. The Athearn lights are 1.5V light bulbs and therefore require a voltage-dropping resistor.

To determine the needed resistor value, place the locomotive on the main line, set to the forward direction, and turn F0 on with the throttle. Don't have the bulb connected when you do this or it will blow up. You can then measure the function voltage. Mine was 13.5V, which is typical. That meant the resistor had to drop 12V to leave 1.5V for the bulb. Most Athearn bulbs draw about 15 mA of current, so using Ohm's Law ($V = I \times R$) and a little high school algebra, I found I needed an 800Ω resistor.

I didn't have one on my workbench, but I did have a 1k resistor. I tried that and found that it made the bulbs too dim, so I ended up using a 680Ω resistor in series with a 150Ω resistor for a total resistance of 830Ω. A slightly larger resistor than the calculated value allows for some variation in bulb current and lowers the voltage on the bulb for a little longer life. I had 1/2 watt resistors, but 1/4 watt resistors would do in this case.

I wired the lower light to the front function output (middle two tabs of the front of the decoder) with the resistor combination wired in series with one of the leads of the bulb. The red light was wired to the rear function output (middle two tabs of the rear of the decoder), again with the resistors wired in series. The resistors and leads were covered in heat shrink tubing to prevent shorts. See **fig. 4**.

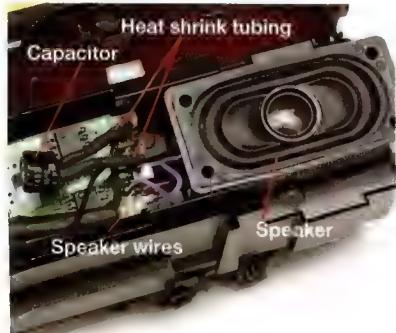


Fig. 3 Speaker installation. Mike added an 8Ω speaker from Tony's Train Exchange to his locomotive. He covered the wiring with heat shrink tubing to prevent a short.

On the prototype the red light is an oscillating headlight, but as wired the white light will come on when the locomotive is running in the forward direction and the red light will be constantly light when the locomotive is running the reverse direction.

The DSD-AT100LC decoder has a number of lighting effects and function mapping tools to make this more prototypical. I set the white headlight to be on in both directions when activated by F0 by programming CV33 and CV34 to 1. A value of 1 in CV49 made the headlight dimmable, and a value of 128 in CV38 made the dimming controlled by F4.

The decoder only allows the red headlight to be remapped to F1 or F2. Function 1 is normally the bell in a sound decoder and F2 the horn or whistle. Many throttles have a momentary contact on F2 to aid in making whistle signals, so I kept F2 as the horn. To make the red headlight controlled by F1, I programmed the value 2 in CV35. To make the red light oscillate I programmed the value 4 into CV50. I moved the bell to F3 by programming the value 1 in CV37.

Retrofitting a direct-current model with a sound decoder and speaker requires some wiring and soldering skills, but the results will enhance the realism of your locomotive greatly. **MR**

Send your questions about Digital Command Control to DCC Corner, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail dcc@mrmag.com. We regret we can't answer all the questions we receive.

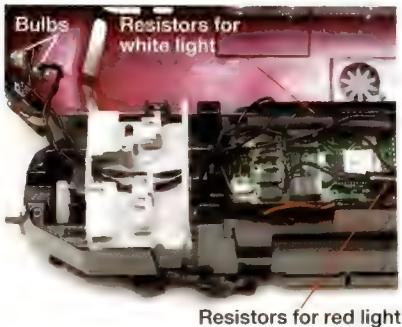
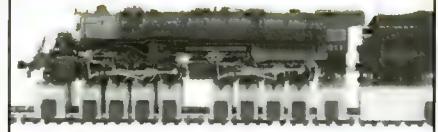


Fig. 4 Wiring the lights. Mike used 680Ω and 150Ω resistors, in series, to wire the lower white headlight and upper red warning light to the printed-circuit board.

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Product Reviews



HO scale EMD SD60M combines solid performance and good looks

A well-proportioned HO scale SD60M diesel locomotive with a dual-mode Digital Command Control (DCC) decoder with sound, detailed cab interior, and separately applied details is now part of the Athearn Genesis line. This newly tooled model (this isn't an upgraded Rail Power Products shell) is based on the General Motors' Electro-Motive Division prototype.

History. Burlington Northern's fleet of 100 SD60M diesel locomotives was built in two groups of 50 between 1989 and 1991. Our sample, BN no. 9261, is based on those produced during the second half of the production run. Railfans and modelers refer to detail differences that took place during production runs as "phases." These

locomotives, known as Phase IIb SD60Ms, have number boxes above the cab windows, two-piece windshields, and tapered noses for better visibility. The Phase Ib SD60Ms are easily recognizable by their three-piece windshield.

A detailed exterior. The model's dimensions closely match drawings in Robert C. Del Grosso's book *BNSF Railway Company 2006 Locomotive Review and Locomotive Diagrams* (Great Northern Pacific Publications, 2006). The distance over the coupler pulling faces is about a scale foot longer, but that's because model couplers are slightly oversize.

The model has see-through radiator fans, central air intake, and exhaust stack silencer. The model also has an electrical cabinet behind the cab on the brakeman's side, freestanding uncoupling levers, separately applied windshield wipers, and wire grab irons. Though the locomotive doesn't have lift rings, there are molded drill-starter points on the roof for those wishing to add them.

The HT-C truck sideframes are crisply molded with separately applied brake cylinders and snubbers. A speed recorder is attached to the front truck on the brakeman's side.

The Cascade Green and black paint was smooth and evenly

applied. Except for a bit of overspray between the green and white on the front of the cab, the color separation lines were crisp. The printing was sharp, and the white heralds, letters, and numbers were opaque. Even the small labels, including FIRE EXTINGUISHER INSIDE and LUBE OIL DIPSTICK INSIDE, were legible under magnification.

The model has an injection-molded plastic 4,500-gallon fuel tank that is secured to the chassis with a single Phillips screw. Burlington Northern SD60Ms have 5,000-gallon tanks, but the difference isn't that noticeable in HO scale. The tank is well detailed with fuel fillers, sight gauges, and drain and vent pipes.

Under the shell. To get under the shell, I first unscrewed the coupler boxes and fuel tank. I then removed two additional screws (one behind the front truck on the engineer's side and the other in front of the rear truck on the brakeman's side). I removed the shell carefully, as the wires for the headlights and ditch lights are tethered to the printed-circuit (PC) board.

More on our Web site

Want to see and hear the Athearn HO scale SD60M in action? Current subscribers can watch a video online at www.ModelRailroader.com.

► Reviewed in this issue

82 Atlas O sound-equipped EMD F2A diesel locomotive

84 Bachmann Industries HO scale 2-8-4 Berkshires

86 Kadee HO scale cushion-underframe boxcar

89 Micro-Trains N scale three-dome tank car

► Athearn HO SD60M

Price: Direct-current \$139.98 to \$159.98, Digital Command Control with sound \$239.98 to \$259.98

Manufacturer

Athearn Trains
1550 Glenn Curtiss St.
Carson, CA 90746
www.athearn.com

Road names: SD60I lettered for Conrail and CSX. SD60M decorated for Burlington Northern (Cascade Green and "Pulling for Freedom" schemes), Burlington Northern Santa Fe (no. 9297 and Heritage II), and Union Pacific. Undecorated versions of both prototypes also available

Inside the cab is a one-piece interior with three seats, two operator consoles, and electrical cabinets on the back wall. The gray injection-molded plastic interior looks great and is clearly visible through the front and side windows.

The speaker is mounted in the radiator section of the long hood. The factory default for the volume is 3 (maximum), which was loud and tinny sounding. A booklet included with the locomotive lists the configuration variables (CVs) for the various sounds.

There are 16 different horn types and 6 different bells to choose from. One odd quirk is that when the horn is activated (both in DC and DCC), the bell also starts to ring. The bell can be activated independent of the horn.

The constant, directional headlights turn on and off gradually. When the horn is activated, the ditch lights flash in an alternating pattern for 10 seconds. A limited number of sound and light effects can be activated in DC using the wireless handheld remote controller included with the model.

On the test track. I first tested the locomotive in DC mode, and the headlights and sound started at 5.8

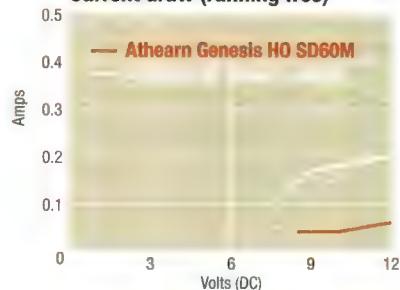
► HO SD60M features

Blackened metal wheelsets, correctly gauged
Celcon handrails
Detailed fuel tank
Drawbar pull: 3.36 ounces (equivalent to 47 free-rolling HO freight cars on straight and level track)
Five-pole skew-wound motor with dual flywheels
McHenry magnetic knuckle couplers at correct height
Minimum radius: 22"
Railroad-specific details
See-through grills
Weight: 20.7 ounces
Wireless handheld remote controller for operating sound effects on direct-current layouts

Drawbar pull (ounces)

Athearn Genesis HO scale SD60M
Average HO diesel – sound

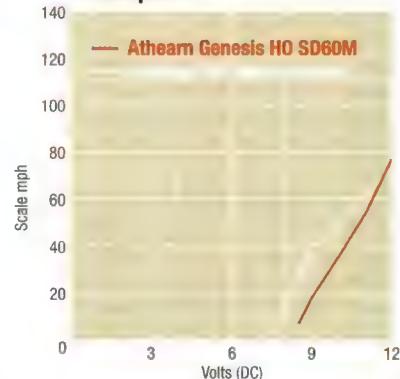
Current draw (running free)



	Draw when slipping	Draw when stalled
Genesis HO scale SD60M	.08A	.10A
Average HO diesel – sound	.32A	.80A

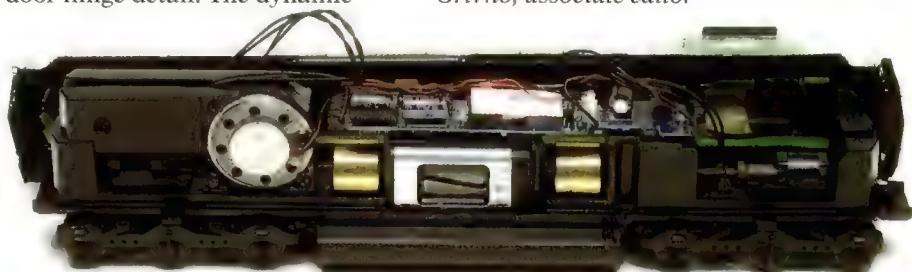
"Average" data based on comparable locomotives reviewed recently

Scale speed



	Minimum sustained speed
Athearn Genesis HO scale SD60M	6.9 mph
Average HO diesel – sound	3.2 mph

brake grids and radiator screens are lightly weathered, which is a nice touch. Though the top speed for the model is high in both DC and DCC, the locomotive runs well and is a good puller. — *Cody Grivno, associate editor*



Underneath the shell is a five-pole skew-wound motor with dual brass flywheels, a printed-circuit board, and a speaker for the sound system.



Dual-mode Van Sweringen Berkshire performs well on DC and DCC layouts

The "Van Sweringen" Berkshire 2-8-4 was one of the last great steam locomotive designs. This Bachmann HO scale Berkshire is an accurate depiction of the prototype. The model features a dual-mode decoder that automatically switches between DC and Digital Command Control (DCC).

Van Sweringen Berkshires. The prototype for the Bachmann model is one of the 300 2-8-4 Berkshires built for railroads owned by the Van Sweringen brothers of Cleveland, Ohio. The Van Sweringen railroads – the Chesapeake & Ohio; Erie; New York, Chicago & St. Louis (Nickel Plate Road); and Wheeling & Lake Erie – formed an Advisory Mechanical Committee that designed the Berkshire.

Although some Berkshires were built by the American Locomotive Co., most of the Van Sweringen Berks were built by the Lima Locomotive Works. A large number of these locomotives went to the Nickel Plate Road, which had a Berkshire fleet that eventually totaled 112.

The Nickel Plate Road divided the Lima-built Berks into three classes: S-1 (nos. 715 to 739, delivered in 1942), S-2 (nos. 740 to 769, delivered in 1943 and 1944), and S-3 (nos. 770 to 779, delivered

in 1948). The S-class Berkshires all had the same basic dimensions.

Nickel Plate Road Berkshire no. 779 was the last steam locomotive ever built by Lima and is preserved at the Allen County Museum in Lima, Ohio.

All dimensions of the Bachmann model match drawings of a Nickel Plate Road class S-3 Berkshire in the *Model Railroader Cyclopedia vol. I: Steam Locomotives* (Kalmbach Publishing Co.).

The HO scale locomotive is decorated and detailed for Nickel

Plate Road no. 765, which has been preserved in operating condition by the Fort Wayne Railroad Historical Society in Fort Wayne, Ind.

Model construction. The model is made primarily of plastic, including the boiler, cab, and tender. The molded-in detail is well defined and matches the placement on the prototype, including rivet seams, boiler bands, and sand lines. The Berkshire has separately applied detail parts, including the handrails, throttle linkage, and boiler check valves.

The printed diamond-shaped Lima builder's plates on the sides of

► HO 2-8-4 Berkshire

Price: \$160.00

Manufacturer

Bachmann Industries Inc.

1400 E. Erie St.

Philadelphia, PA 19124

www.bachmanntrains.com

Description: HO plastic and metal ready-to-run steam locomotive

Road names: Nickel Plate Road nos. 765 and 759 (railfan version), Chesapeake & Ohio nos. 2724 and 2760 (Kanawha version), Pere Marquette nos. 1218 and 1225, painted but unlettered (Kanawha and NKP versions)

► HO 2-8-4 features

Automatic dual-mode Digital Command Control (DCC) Can motor with brass flywheel

Dimmable headlight and backup light in DCC

Drawbar pull: 3.2 ounces

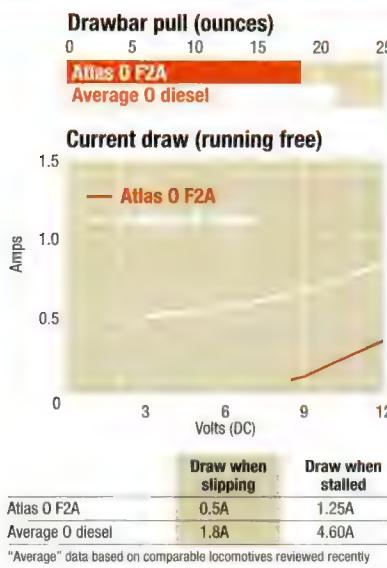
Electrical pickup on all drivers and eight of 12 tender wheels

E-Z Mate Mark II magnetic knuckle couplers at correct height

Minimum radius: 18"

RP-25 metal wheels in gauge

Weight: 1 pound 4.5 ounces



"Average" data based on comparable locomotives reviewed recently

equivalent of 55 O scale freight cars on straight and level track.

The dual-mode QSI Quantum sound decoder operates well and offers realistic sound on DC as well as DCC layouts. Along with the realistic rumble of the diesel engine, I triggered the horn and bell using the direction button of the power pack in our shop.

As outlined in the included instruction manual, you can program many of the decoder's features in DC using only a power pack. Programming of the QSI Quantum sound decoder is made even easier if you use a QSI Quantum Engineer analog DC controller (sold separately).

Programming also was easy in DCC. I changed the F2's long address to its locomotive number. An extensive list of CVs controlling sound and motor performance are also programmable.

Sound effects include the air horn and prime mover. The diesel engine rpm sounds shift through all eight throttle notches.

Speed tests. The Atlas F2 performed well in both DC and DCC modes. Out of the box the model is factory programmed in Regulated Throttle Control (RTC). This gives the F2 realistic momentum when accelerating and decelerating. For our speed tests, I set the model to Standard Throttle Control (STC), which makes the model respond immediately to throttle adjustments. The instructions outline how to switch between RTC and STC in both DC and DCC modes.

In DC the model started moving at 4.5 scale mph at 8.5 volts and accelerated to 82 scale mph at 12 volts. Slow speed performance was better in DCC using 128 speed steps, as the model crawled at 1.5 scale mph in speed step 1 and again reached a top speed of 82 scale mph, which is close to that of one of the prototype's gear ratios offered by EMD.

The Atlas O F2 is a smooth performer in both DC and DCC. Its great sound system makes the O scale F unit a lot of fun to operate.
—Dana Kawala, associate editor



The F2A features dual can motors with brass flywheels. The QSI Quantum sound system includes a speaker mounted in the die-cast metal fuel tank.

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Atlas O F2A sounds like the real thing

With the distinctive rumble of a 567 diesel engine, this O scale F2A replicates the sounds of a first-generation EMD F unit. The Atlas O model features a QSI Quantum sound system with programmable effects in both DC and Digital Command Control (DCC) modes.

The prototype. Beginning with the FT in 1939, the F units built by General Motors' Electro-Motive Division were the first successful road freight diesels designed for mass production. Electro-Motive produced F2 A and B units from July to November 1946. The F2 was a transitional model between the FT and the F3 diesels. (The F2 had a 1,350-hp engine, compared to the F3's 1,500-hp power plant.)

Modelers and railfans use the term "phases" to describe the detail changes that occurred during F3 production. Externally the F2 looks identical to a phase I F3. Key spotting features of an F2/F3A include high radiator fan shrouds, small rear air-intake openings, square corner doors, and center portholes on the body.

Appearance. All the Atlas O model's dimensions match drawings of a Phase I F3 found in the *Model Railroader Cyclopedia: Vol. 2 Diesel Locomotives* (Kalmbach Publishing Co., out of print).

The Atlas O F2 has a plastic body shell with molded and

separately applied details that match prototype photos. All the grab irons are metal. The dynamic brake screens and radiator vents are see-through. Underneath the vents are separately applied fans.

Our review sample came painted in the Boston & Maine's maroon and gold "Minuteman" paint scheme, which was first applied to B&M cab units in 1945. The railroad purchased its F2s in 1946 and the Atlas O model matches prototype photos, including the "Minuteman" herald on its nose.

Matching B units are available for the B&M version. When coupled together the A and B units are prototypically spaced with their diaphragms touching.

Drivetrain and electronics. I removed four screws under the chassis and lifted off the body shell. At each end a can motor with a flywheel transfers power to a gearbox above each truck. A printed-circuit (PC) board with the DCC decoder mounted on top of it is between the trucks. The speaker for the sound system is mounted in the fuel tank.

The fuel tank, trucks, and chassis are die-cast metal. The hefty Atlas O F2 has a drawbar pull

► O scale F2/F3 diesel

Price (single A or B unit):
\$419.95 (DC), \$479.95 (DCC),
\$199.95 (unpowered)

Manufacturer

Atlas O
378 Florence Ave.
Hillside, NJ 07205-1799
www.atlasO.com

Description: Ready-to-run plastic and metal diesel

Road names: (two road numbers each) Boston & Maine; Chicago, Burlington & Quincy; Lackawanna; New York Central; Rock Island; Southern Ry.; and undecorated (single- and double-headlight versions)

B units for B&M, Lackawanna, SR, and undecorated

► Atlas O F2/F3 features

All-wheel drive and electrical pickup
Blackened metal RP-25 contour wheels in gauge
Die-cast metal magnetic knuckle couplers at correct height
Drawbar pull: 1.2 pounds
Dual-model Digital Command Control decoder (DCC version only)
Dual can motors and flywheels
Minimum radius: 36"
QSI Quantum sound system (DCC version only)
Weight: 3.75 pounds

IN OCTOBER'S ISSUE

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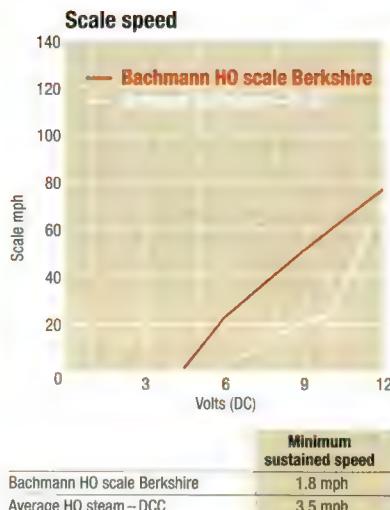
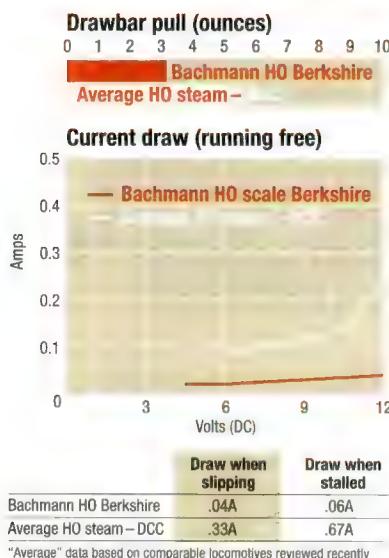
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the locomotive's smokebox are legible under magnification.

Detail inside the cab is sparse. Engraving on the backhead depicts the basic outline of the firedoors and some piping. There are no seats or crew figures. However, there is glazing in all the cab windows and the cab walls are painted green as on the prototype.

Our review sample came decorated as Nickel Plate Road no. 765 as she looks today when leading excursion trains. The locomotive's running boards, footboards, driver tires, and leading truck, trailing truck, and tender wheels are edged in white.

The placement of the lettering matches prototype photos. The Nickel Plate Road lettering across the tender's sides is noticeably thicker than on the prototype.

Drivetrain. The can motor and brass flywheel are inside the rear half of the locomotive boiler and contribute to most of the model's weight. The motor turns a worm gear that transfers power to a gearbox above the third axle. The other drivers are powered through the motion of the side rods.

The engine drawbar has two holes. The outer hole spreads the cab and tender apart to allow the locomotive to negotiate tight curves. The inner hole provides more prototypical spacing.

Electrical connections consist of a two-pin plug and a four-pin plug on the tender that connect to sockets under the engine cab.

After removing four screws on the bottom of the plastic tender frame, I pulled off the tender shell. The printed-circuit board and DCC decoder are mounted on top of a metal weight that's screwed to the tender frame. There's plenty of room for adding a sound system.

Performance. The Bachmann Berkshire ran reliably in both DC and DCC but has a noisy motor in both modes.

In DC the headlight came on at 4.5 volts and the model started moving at 1.8 scale mph. The Bachmann Berkshire reached a top speed of 77 scale mph at 12 volts, which is within a couple scale mph of the prototype.

The model's DCC decoder supports 28 speed steps, but our sample didn't start moving until speed step 4. I tried adjusting the starting voltage and acceleration but the model still didn't move in speed steps 1, 2, or 3. The Berk's starting speed was an incredibly slow .2 scale mph and reached a top speed of 77 scale mph in step 28, which is close to that of a prototype Nickel Plate Berk.

In DC and DCC the Bachmann Berkshire has enough power to pull the equivalent of 45 average HO scale freight cars on straight and level track.

Although its DCC features are limited, this HO 2-8-4 still performed well. The Bachmann Berkshire would make a great addition to a late steam-era roundhouse. —D.K.

In the October issue

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HO boxcar has a working cushion underframe

An operating cushion underframe is a great new feature that Kadee has incorporated into its HO scale line of Pullman-Standard 50-foot PS-1 boxcars. The characteristic extensions of the car's sliding center sill make this distinctive model easy to spot anywhere.

Cushion underframes have been around since the 1920s when railroads began searching for ways to reduce impact damage due to switching and slack action. Ordinary boxcars use energy-absorbing draft gear with about 3" of travel within the rigid coupler boxes. In contrast, "cushion-underframe" cars had their couplers mounted on a sliding sill that could move up to 10" in a channel passing through the center of the underframe. Various friction-operated cushioning devices connected the sliding sill to the car's underframe.

As boxcars grew in capacity during the 1960s, the need for additional cushioning became evident and Pullman-Standard

began offering Hydroframe 60 long-travel cushion underframes on the firm's popular line of PS-1 boxcars. This new generation of cars used hydraulic cushioning and up to 30" of travel to dissipate any impact the sliding sill received. However, a cushion underframe protects only its own carbody, as the rigid length of the sliding sill will transfer any hard impact straight through to the next car in line.

Large reductions in damage claims made these cushioned cars extremely popular with shippers of bottled and canned goods, glass, roll paper, and similar heavy products that are easily damaged.

Kadee's new boxcar is a superbly finished model detailed to represent one of 200 cars built for the Gulf, Mobile & Ohio RR in 1963. Like the prototypes, this model combines Kadee's original 50-foot PS-1 body shell with a revised underframe. Numerous details like ladders, grab irons, and running boards are individually applied, and a clever system of internal guides allow the sliding doors to operate smoothly with scale-size exterior hardware.

Most of the model's weight comes from the die-cast metal floor, which snaps into the body. The sliding sill and underframe details are molded styrene, and they're secured by the truck screws. Concealed coil springs allow the sliding cushion sill to move correctly under impact, and then return to its centered position.

Our sample came with appropriate Kadee ASF Ride Control solid-bearing trucks. These free-rolling trucks have metal RP-25-contour



The sliding center sill moves in both directions to help cushion impacts.

► Kadee HO PS-1 boxcar

Price: GM&O, \$32.95; others, \$34.95

Manufacturer

Kadee Quality Products

673 Avenue C
White City, OR 97503-1078
www.kadee.com

Road names: Gulf, Mobile & Ohio; Atlantic Coast Line (black); Missouri-Kansas-Texas; and Rock Island

► Kadee HO boxcar features

ASF solid bearing trucks

Kadee scale magnetic knuckle couplers at correct height
Operating cushion underframe
RP-25 contour metal wheels
mounted in gauge
Weight: 4.5 ounces (matches NMRA RP-20.1)

wheels mounted on needle-point acetal plastic axles. The wheelsets match the National Model Railroad Association's standards gauge.

Kadee metal scale couplers are mounted at the proper height, and the model weighs 4½ ounces.

Our sample was smoothly painted dark green with clearly printed white lettering. Even the smallest lettering was readable.

Sometimes it's hard to improve on success, but Kadee has certainly done it here. This is a well-done model of a popular prototype boxcar. — Jim Hediger, senior editor

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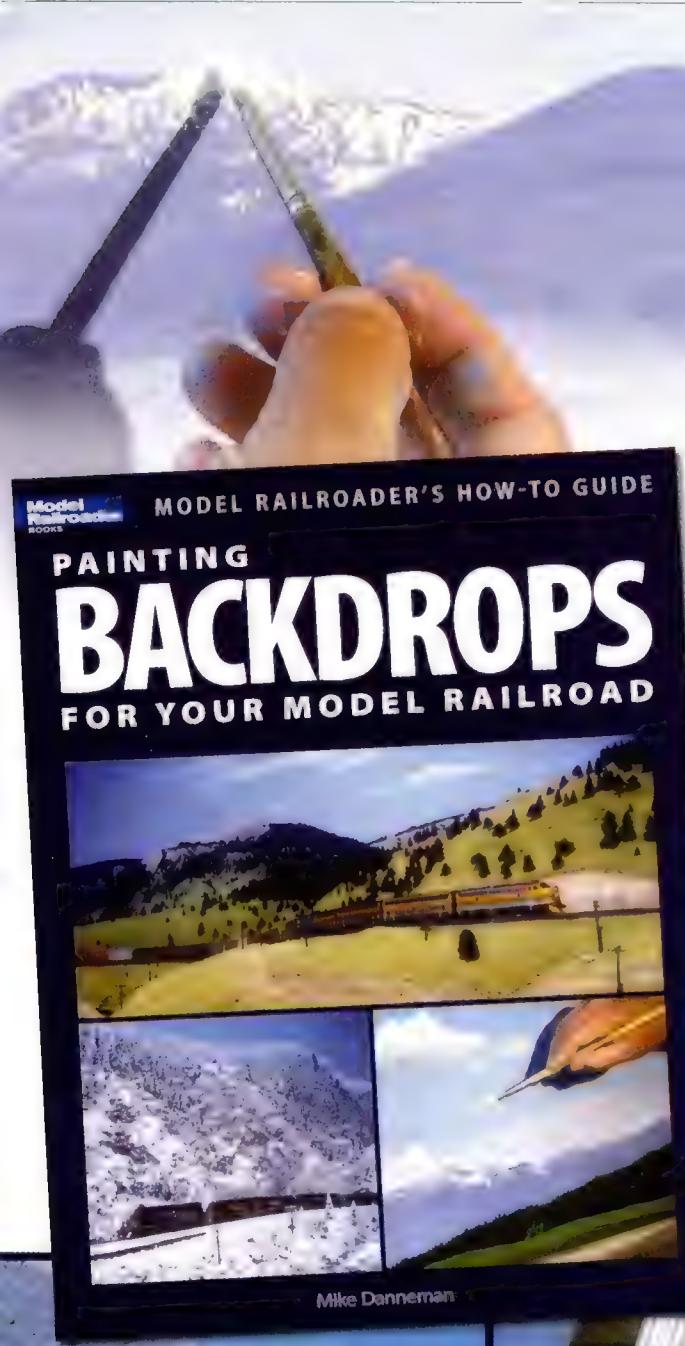
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Product Reviews



Three-dome tank car is perfect for small industry

This three-dome tank car, a new model that Micro-Trains Line has released in three road names so far, is a good-looking car that belongs on any steam-era N layout.

The prototype was built by American Car & Foundry in the 1930s and '40s. The car carried loads such as different grades of petroleum products.

The three-dome tank car could more correctly be called a three-tank car. Its body is divided into three compartments of differing size, allowing it to carry three different cargos. This makes the car ideal for smaller industries that wouldn't generate enough business to receive full-car loads. For example, a fuel dealer might get one of these cars laden with gasoline, kerosene, and fuel oil.

The model matches the appearance of a car pictured in the 1937 *Car Builder's Cyclopedia*, right down to the placement of rivet bands and brake equipment. Only pressure vents on the sides of the domes are relocated to their tops.

The tank is made with new tooling, and the engineering shows. The model features fine rivet detail, thin wire handrails, and an acetal plastic brake wheel that measures a scant .004" thick.

The lettering printed on our samples was for the most part crisp and opaque. All of it was legible under magnification, even the .01" high car data near the ends. There were tiny voids in some of the letters on the car, but these were visible only under extreme magnification.

My only quibble with the car is one it shares with a lot of other N scale rolling stock: the wheels. The

► N scale tank car

Price: \$22.70

Manufacturer

Micro-Trains Line
P.O. Box 1200
Talent, OR 97540
www.micro-trains.com

Road names: Anderson-

Pritchard Oil Corp. (silver),
Shell Chemical Co. (orange),
and Pan-Am/Shipper's Car
Line (black)

► N scale tank car features

33" one-piece molded plastic wheelsets, in gauge (flanges too large)

Micro-Trains magnetic knuckle couplers, truck-mounted, at correct height

Wire handrail

model rides on scale 33" wheels with flanges that are too large. Though the car rode just fine on the code 80 Atlas track on our Carolina Central project layout, on code 55 track the flanges bump along on the ties. This is easily remedied by replacing the one-piece molded plastic wheelsets with low-profile wheels from Micro-Trains, Atlas, InterMountain, or NorthWest Short Line.

Overall, this new tank car by Micro-Trains Line is a good-looking piece of equipment that brings versatile operating options to layouts set from the 1930s to the steam-diesel transition era. — *Steven Otte, associate editor*

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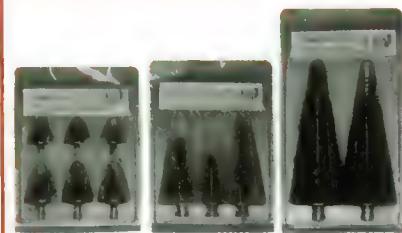
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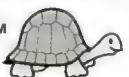
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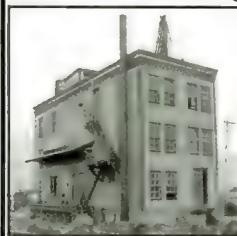
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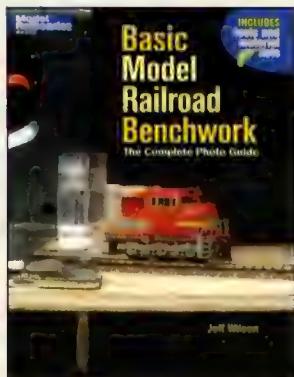
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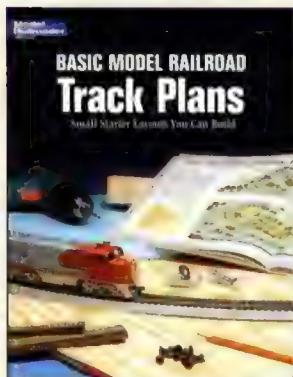
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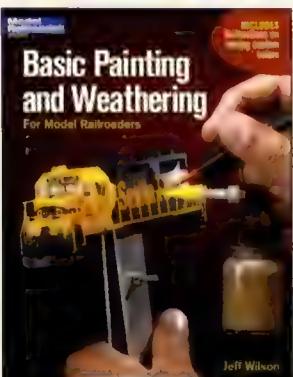
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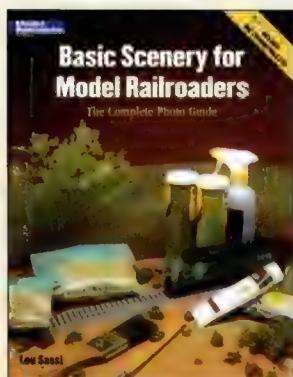
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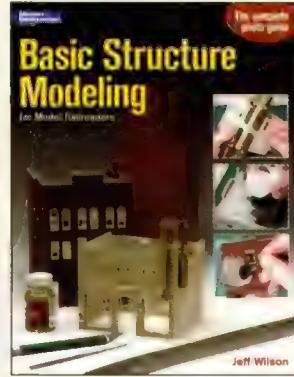
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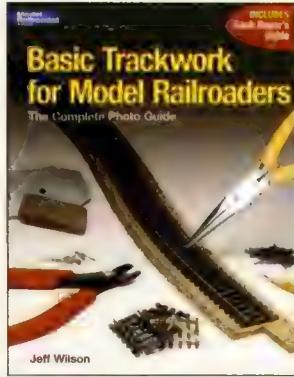
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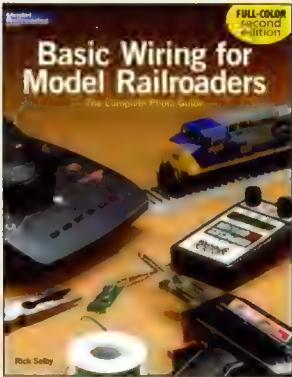
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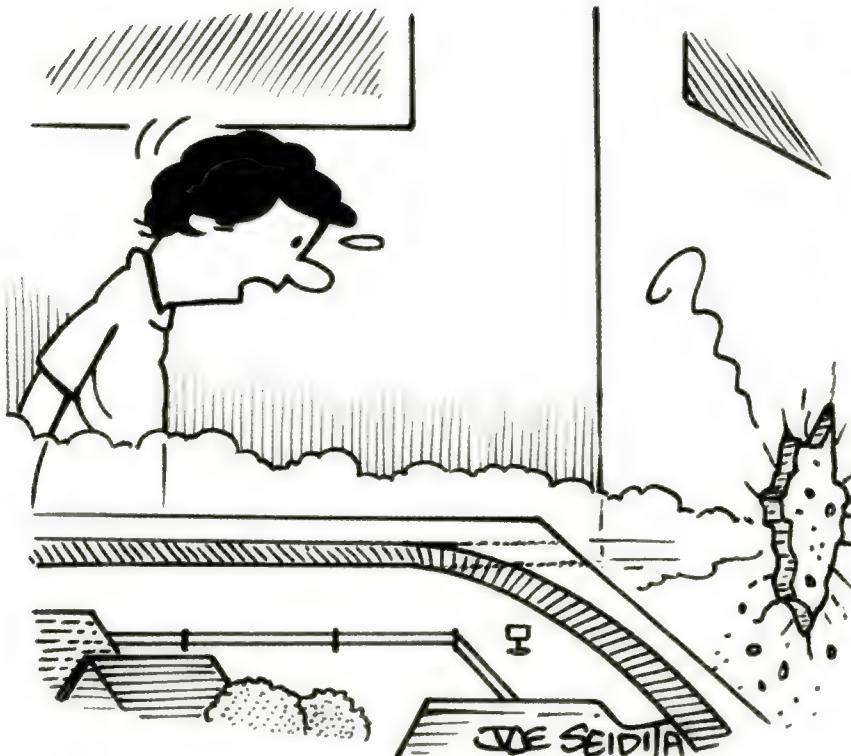
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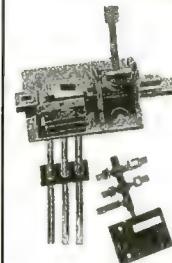
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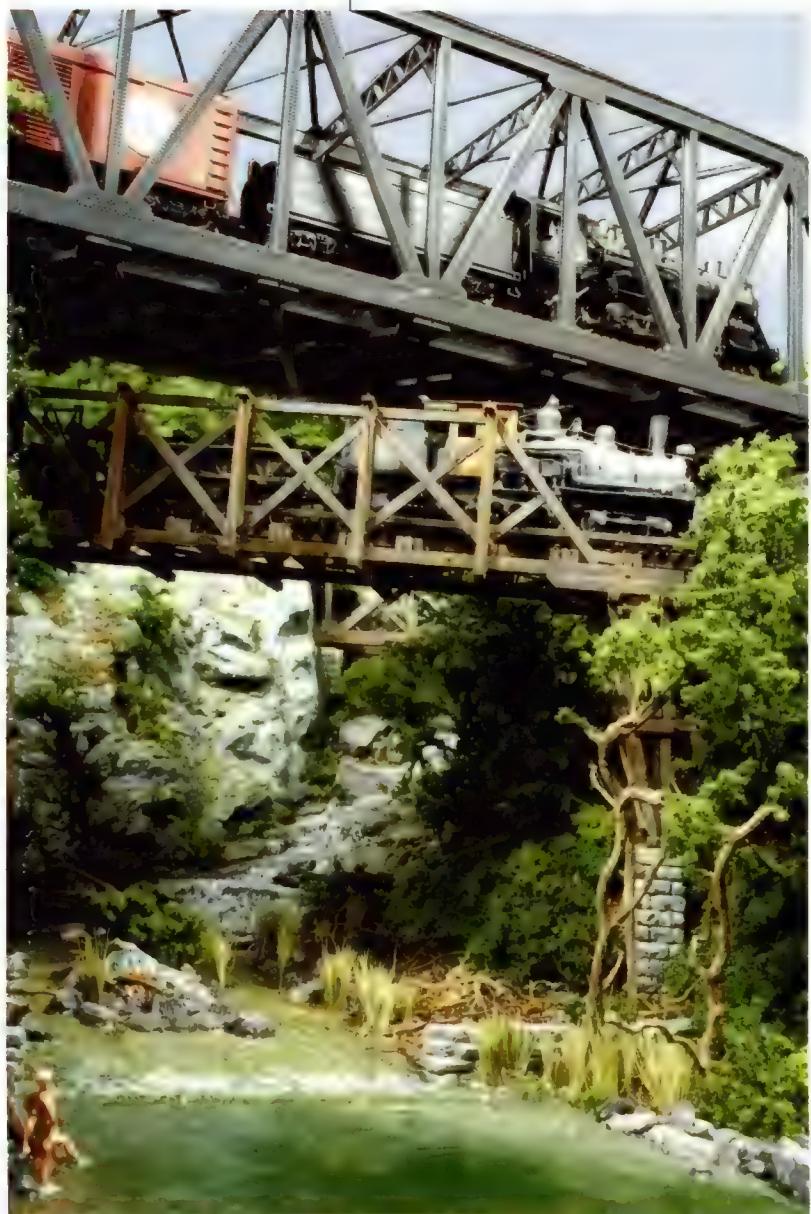
A trio of HO scale Electro-Motive Division GP40s heads up a coal drag on the Craig Branch on "Chama 1978," a Denver & Rio Grande Western layout built by Mitch Valder of Rocklin, Calif., and Aaron Splawn of Roseville, Calif. Mitch photographed the scene outdoors in daylight.

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A Rochester, Syracuse & Eastern RR 2-8-0 pulls a fast freight across the upper bridge just as a Shay with a local crawls by on the bridge below. The meet took place on Brian Curry's N scale layout, which was open for tours during the National Model Railroad Association's Northeast Region Convention in Syracuse, N.Y., in September. Jeff Paston photo



Trackside Photos



Otter Creek & Ripton engine no. 3 blasts under "The Cliffhanger," a favorite sight for tourists on the steeply graded railway, which is set in Vermont. The On3 scene was inspired by similar rock formations layout owner David McLeod of Burlington, Vt., saw on lines in Alaska and Sri Lanka. David took the photo.

Fresh from the paint shop, Alco S-2 switcher no. 252 spots a chlorine tank car at Kaetelyn Chemicals on Roger Cason's HO scale Delaware & Western RR. Roger shot the photo.

An Electro-Motive Division GP20 pulls a block of refrigerator cars on Sergio Milko's HO scale Atchison, Topeka & Santa Fe. Sergio, who lives in Ituzaingó, Argentina, has never visited the southwestern United States, but models the area based on photos, using Woodland Scenics and Silflor scenery and natural materials. Sergio took the photo and added the backdrop electronically.





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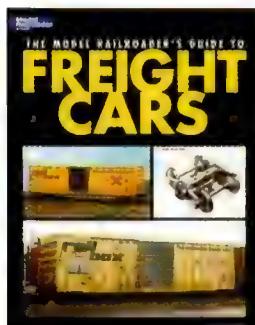
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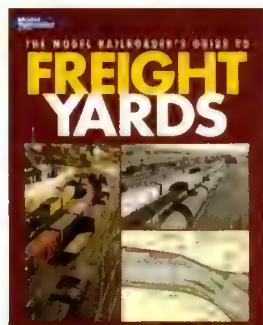
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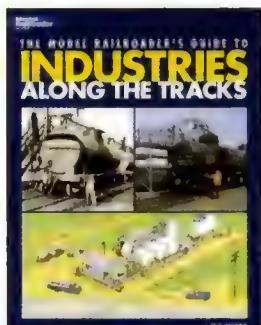
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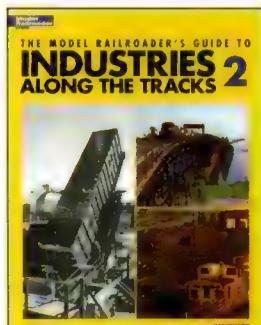
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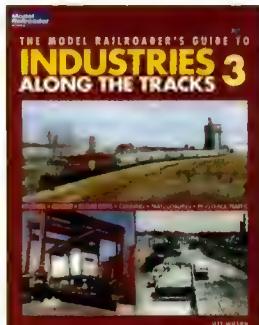
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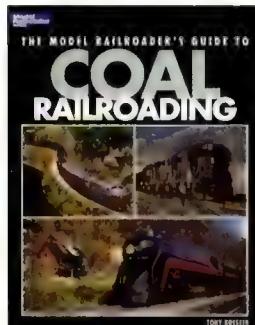
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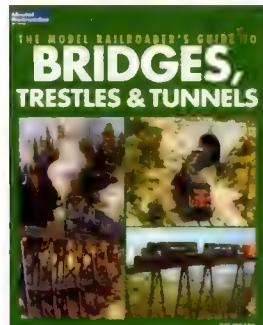
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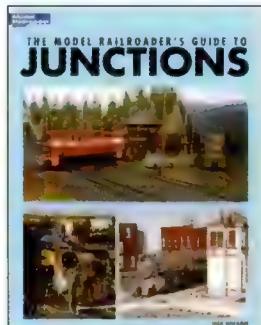
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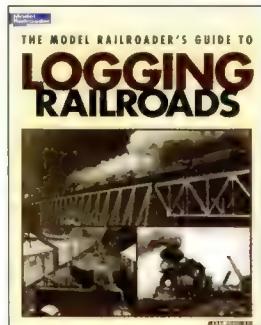
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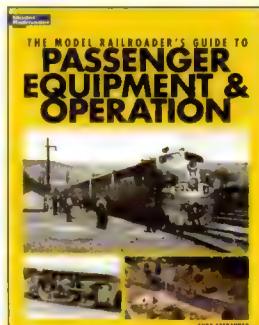
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Trains of Thought

Fixing brass steamers

Tony Koester



In attempting to fix one of his brass steam locomotives, Tony applied heat from a soldering iron to the lead truck . . . only to have the rear tender truck fall apart in the process! Tony Koester photo

When I was just getting serious about scale model railroading, I read all of the how-to tips and techniques printed in these pages and attended model railroad conventions to learn from the experts. In so doing, I picked up a couple of bits of knowledge that I should now pass along to a younger generation. To wit: how to solder parts to or remove parts from a brass locomotive.

It ain't like you think.

Decades ago, some wise person prepared a detailed list that the unsuspecting, ill-informed neophyte (me) could use when, say, trying to remove the sand dome from a brass steam locomotive. Hint: You don't apply the heat to the sand dome.

In fact, should you innocently apply heat from a big soldering iron or torch to said dome, the pilot will fall off. That will induce several health problems ranging from rapid heartbeat to sweaty palms, causing you to drop the engine and damage the cab.

Should you then, in utter stupidity, submit the damaged cab to heat in a vain attempt to repair it, the air compressor will fall off. If the fall bent the locomotive's stack, heating it will cause the

steam dome and bell to drop to the floor. And so it goes.

The late John Armstrong, who was among the most cerebral of model railroaders, once prepared a chart that showed the increasing amount of pain that a model steam locomotive would inflict upon its owner as the radius of the curve he or she wants it to negotiate decreases. Yet going the other way, as the curve radius approaches infinity – that is, a straight line – the pain never goes to zero.

I can add to John's findings: If a model steam engine is sitting off the track on your workbench, it will still inflict pain. You think I'm exaggerating? Have a seat; let's talk.

One of my prized brass Berkshires decided that things were going too well two operating sessions ago and caused its lead truck to derail. Never mind that it had operated over tighter curves on my previous layout, the Allegheny Midland, for years without a hiccup; it decided it was time to cause problems.

I investigated and found the tongue of the lead truck was worn thin and had bent around the mounting-screw hole, preventing the truck from pivoting as it should. I set it aside for repair.

The day before the next session, I flipped the 2-8-4 upside down in a foam cradle, then removed the lead truck. I applied a coat of silver-bearing solder to the thin pivot-hole area, reamed out the screw hole, and filed down the solder to form a smooth, but thicker, tongue. No sweat.

Then I flipped the engine right side up and placed it back on the rails. Everything seemed fine until I heard a rattling sound coming from far astern. To my horror, I saw that the rear Buckeye six-wheel tender truck had fallen apart. Clearly, I had forgotten the rule about heating the lead truck causing the solder joints in the rear tender truck to fail.

This was no time to mess with soldering the sideframes back to the bolster – there was no telling what trouble that would have caused elsewhere – so I replaced that truck with another from a sister brass Berkshire sidelined with a blown decoder.

Once again, I flipped the engine to the wheels-down position and discovered I had two separate models in my hands – the engine in my left hand and the tender in my right – whereas moments before they had been connected by a drawbar. The plastic boss into which the drawbar screw is mounted had pulled loose from the frame under the cab.

Some cyanoacrylate adhesive (CA) and colorful language (CL) later, all was well, and the engine was at last on the rails for a test run. And it ran fine – for about an inch. Then – bzzzt! – it stopped. A short had been added to the list of the evening's entertainment.

I turned the lights out and saw a spark near the lead truck (back where we started, you'll recall). After several vain attempts to pin it down, I coated the entire area with Scotch tape and clear fingernail polish (which my wife will discover missing any day now) – and still had a short. Long story "short," I discovered it was a turnout set against the engine, not the engine at all (for once).

Moral of the story: Listen to your elders, especially John Armstrong. **MR**

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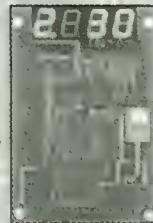
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Note to Readers: Show dates, times and locations sometimes change. Please confirm the details before driving any distance.

Please go to www.mrrmag.com and click on the Schedule of Events section to get more complete information on these and other coming events.

CA, WATSONVILLE: SANTA CRUZ COUNTY RAILROAD HISTORICAL SOCIETY SWAP MEET. County Fairgrounds Harvest Building, 2601 East Lake Ave. (Hwy. 152). October 4-5, 2008. Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. Adults \$7.00, children 12/under free. Layout, free parking, food, RV hookups \$20.00. Contact Chuck Rudisill 831-247-3695. Screambird@msn.com

CO, MONROSE: WESTERN COLORADO MODEL RAILROAD EXTRAVAGANZA Hosted by: San Juan Model Railroad & Historical Society. October 4th (10:00am-5:00pm) and 5th (10:00am-4:00pm) 2008. At the Montrose County Fair Grounds, 101 North 2nd Street. Contact: Paul 970-323-6469.

FL, DEERFIELD BEACH: DEERFIELD BEACH RAILROAD MUSEUM SWAP MEET. Amtrak Station, Hillsboro Blvd. Saturday, October 18, 2008, 9:00am-3:00pm. Displays, layouts, vendors and refreshments. Admission: Free. Information: Butch Tanis at 954-974-6798.

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MA, HINGHAM: SOUTH SHORE MODEL RAILWAY CLUB FALL OPEN HOUSE AND SHOW. Bare Cove Park, Building 51, 19 Fort Hill Street. October 25th & 26th, 2008, 9:00am-4:00pm. Dealers, operating layouts, white elephant table, rail movies, concessions. Free parking, handicap accessible. Jack Foley, www.ssmrc.org 781-740-2000 Fax: 781-740-8900.

MA, TAUNTON: OLD COLONY MODEL RAILROAD CLUB seventh annual model railroad show and sale. Taunton Holiday Inn, Myles Standish Industrial Park, Exit 9 from Route 495. September 28, 2008, 10:00am-3:30pm. Adults \$4, children under 12/scouts in uniform free. Contact Dennis Ingalls, 508-285-3963, e-mail: dingalls@comcast.net

MD, TIMONIUM: GREAT SCALE MODEL TRAIN PLUS HI-RAIL & COLLECTIBLE TRAIN SHOWS. Maryland State Fairgrounds, Oct 11-12, 2008. Saturday 9:00-4:00pm, Sunday 10:00-4:00pm. Adults \$9.00, family \$18.00, under 13 free. Free parking. 650+ vendors plus 25,000 sq ft of layouts; free movies. Howard Zane 410-730-1036, hzane1@comcast.net www.GSMTS.com

MI, KALAMAZOO: KALAMAZOO MODEL RAILROAD SOCIETY 29TH ANNUAL TRAIN SHOW AND SALE. County Fair Grounds, Hazel Grey Building. October 26, 2008, 10:00am-3:30pm. Admission: \$5.00 for adults. Children 12 and under are admitted free when accompanied by an adult. Contact: Jake Kuivenhoven, 269-375-1248

MN, ST. PAUL: TCMRM TOY TRAIN & MODEL RAILROAD SHOW AND SALE. Saturday, September 20th, 2008, MN State Fairgrounds Education Bldg., 9:00am-3:00pm. Admission \$5, FREE under 5. 200+ tables of scale models, toy trains, railroadiana. FREE museum admission w/Sale handstamp. Contact: www.tcmrm.org

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NJ, ASBURY PARK: GARDEN STATE CENTRAL MODEL RAILROAD CLUB 45TH ANNUAL OPEN HOUSE. Located at the Club Headquarters, 607 8th Avenue. October 17, 18, 19, 24, 25 & 26, 2008. Fridays 7:00pm-9:00pm, Saturdays and Sundays noon-4:00pm. Donations: Adults \$5.00, kids and seniors \$3.00. Info: www.gardenstatecentral.com

OH, BEREAL: DIV 4 MCR NMRA CARNIVAL '08, Cuyahoga County Fairgrounds, October 4th & 5th, 2008. Saturday 10:00am-5:00pm, Sunday 11:00am-4:00pm. Adults \$6.00. Two day pass \$9.00. Children under 16 free w/adult. Contact: Barb Mickley 216-598-0783.

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PA, HAZLETON: ANTHRACITE MODEL RAILROAD SOCIETY OPEN HOUSE. Thanksgiving, November 26, 2008: 5:00pm-8:00pm, Fridays 6:00pm-8:00pm, Saturdays 12:00noon-8:00pm, November 27th to January 3 plus Sunday January 4 1:00pm-5:00pm. www.amrsclub.org jps2102@verizon.net, chuckandmaryann@verizon.net, trainnut@ptd.net 570-498-5948 or 570-645-9133 or 570-952-7843

PA, TAMAQUA: PVT A MODEL RAILROAD SWAP MEET. Salvation Army Building, West Broad St., 1/2 block from Reading Station. October 14, 2008, 8:00am-3:00pm. Annual Heritage Day Train Show. Admission \$3.00, under 12 free. For info. trainnut@ptd.net 570-645-9133 or 570-952-7843. Dealers welcome.

RI, SMITHFIELD: GREATER RHODE ISLAND MODEL TRAIN SHOW Smithfield Elks Lodge, 326 Farnum Pike. October 18-19, 2008, 10:00am-3:00pm both days. Sponsor: Little Rhody Division/NMRA. Admission: Adults \$5.00, Seniors and Children \$3.00. Children under 6 are free. Contact: Don Irace, E-mail: Irdsshows@cox.net

TX, ROSENBERG: ANNUAL ROSENBERG RAILROAD FESTIVAL Museum site, 1921 F Street in downtown Rosenberg, October 11, 2008, 10:00am-5:00pm. Admission \$5.00. Great train watching. Railroadiana dealers. Info: LSSAE to Rosenberg Railroad Museum, PO Box 369, Rosenberg, TX 77471 opr 281-633-2846.

VA, VIRGINIA BEACH: TIDEWATER DIVISION'S ANNUAL TRAIN SHOW AND SALE Virginia Beach Convention Center, 1000 19th Street, September 20-21, 2008, 10:00am-4:00pm both days Admission: Adults \$7.00/children under 12 free w/adult. Operating trains, Lego trains. Info 757-426-2811, e-mail nawneycreek@msn.com www.groups.hamptonroads.com/TDWDMER/ for printable flyer: www.virginiateachconventioncenter.com for map.

WA, VANCOUVER: 36TH ANNUAL GREAT TRAIN SWAP MEET Hudson's Bay High School Commons, 1206 E Reserve St. Southwest Washington Model Railroaders. Saturday, October 4, 2008, 9:30am-3:30pm. Admission \$4.00 for adults and \$2.00 for students. Under 6 are free. Contact Richard Renihan at 360-892-3410 or rrenihan@msn.com

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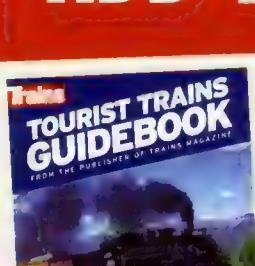
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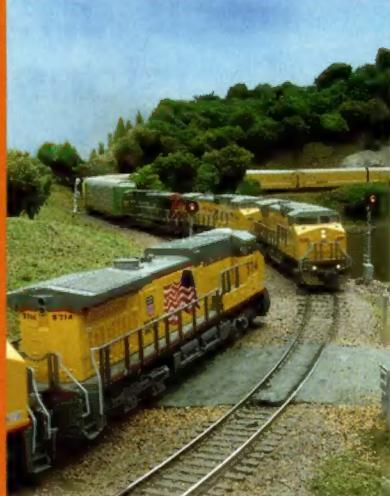
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MAGAZINE

The Operators

Andy Sperandeo

Decisions, decisions

The fun in timetable-and-train-order operation as an engineer or conductor is that you have to think your way across the railroad. To give you some sense of what that means, here's a review of the decisions involved every time a train heads out onto the main line. To save time and space I won't spell out all the rules involved. If you're curious about them, see the book *Rights of Trains* by Peter Josserand (Simmons-Boardman).

First we ask ourselves if we have authority to use the main line. At our initial station that means a clearance card authorizing our train to run on a timetable schedule or with a Form G train order authorizing us to run extra with our assigned engine from the initial station to our destination. If we're running extra we'll have to display white signals on the engine, flags or classification lights, to mark our status as a train without a timetable schedule.

If we'll be running as a scheduled train, we either have to wait for our scheduled departure time, or if that's already past, make sure it's still less than 12 hours after that time. Unfulfilled timetable schedules expire after 12 hours.

We'll also have to see if our clearance specifies that our scheduled train is running in sections, meaning two or more trains moving on the authority of the same timetable schedule. If so, we should have a Form F train order with our clearance telling us to display signals (green flags or class lights) for the following sections. If we're the last section (or the only one), we won't need to display signals.

When we're certain of our authority, we next need to make sure that no other train's authority exceeds ours. For that we need to know if all opposing superior trains due within 12 hours of our departure have in



Southern Pacific 4-10-2 no. 5016 is meeting Train 2, the eastbound *Sunset Limited*. Whether the 5016's freight train leaves after the passenger train passes depends a series of decisions by the freight's crew, and the signal indications may not be a factor. Walter H. Thrall photo

fact arrived. We have to look only 12 hours back because any schedules older than that have expired.

At our initial station we do this by checking the train register, a book where the conductors of arriving trains sign in. At the same time, we can sign out for our train's departure. If an opposing superior train due within the last 12 hours hasn't shown up, we'll have to wait for it. Intermediate stations typically won't have registers, and we'll be responsible for identifying the other trains we encounter to know where we are in respect to schedules.

Next we need to read all the train orders that may have been delivered with our clearance to see if they modify the schedules or superiority of trains. We may have a Form A order to meet a late-running superior train at some station down the line, or a Form C order giving our train right over a train we'd otherwise wait for. If we're running extra, we want to be especially careful to look for orders regarding opposing extra trains. That's because our primary protection against them – especially if it's a "dark" railroad with no block signals – will be train orders.

Are we ready to leave now if we've satisfied all those requirements?

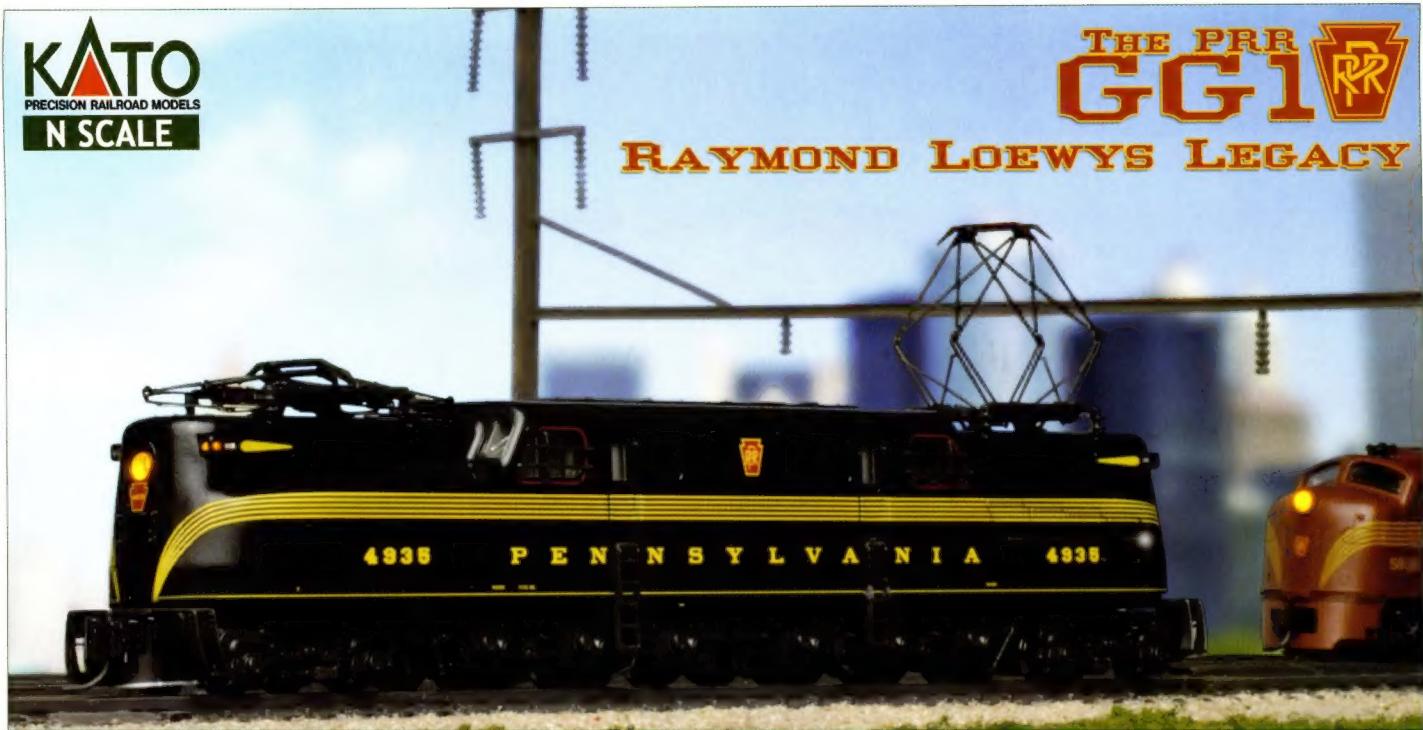
Maybe, but smart railroaders won't pull out onto the main track without a clear idea of how far they can safely go. If we have an order specifying a meet or giving right over a superior train to a certain station, that may be a goal we can aim for. Otherwise we'll read the timetable and match our running time against the schedules of other trains to decide which passing siding down the line our train can get into at least five minutes before the next opposing superior train is scheduled.

So that's how we'll get over the railroad, thinking our way from point to point based on the book of rules, the timetable, and the clearances and train orders we receive. We won't be picking up a phone or keying a radio to ask the train dispatcher if we can pull out of a yard or work on the main line. We'll be making those decisions for ourselves using the information we've been provided.

It's a challenging way to operate, and not necessarily for everybody. But if it sounds like a good time to you, give timetable-and-train-order running a try. **MR**



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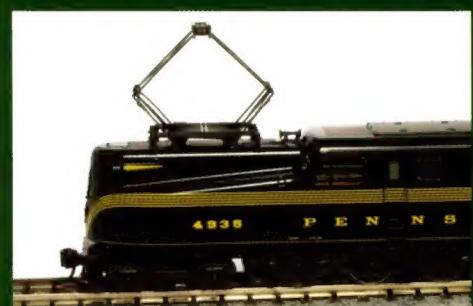
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The Kato GG1 has all the scaled power of the original Loewy design, boasting pulling performance that lets it easily pull a full 15-car "Broadway Limited" consist up a 4% grade, and special shock absorber suspension that lets it ride the rails with ease without worrying about losing electrical contact. The blackened metal pantographs offer three different elevation settings (see right), and provide the finishing touch to this sleek and unique locomotive.



The N PRR GG1 from Kato:

The Ultimate Passenger Power for the PRR Broadway Limited Train



The GG1's pantographs are adjustable between two elevated and one down position for an elegant prototypical appearance.



REGAL SPA

The Santa Fe 4-4-2 "Transcontinental" sleeper was a transfer-car: it would be exchanged between Chief and Limited trains at Chicago.

Item #	Description	MSRP
137-2001	N GG1 PRR Brunswick Green "Five Stripe" #4935	\$139
106-068	PRR Broadway Limited 10 Car Base set	October \$250
106-7111	PRR Broadway Limited 4 Car Add-on set	October \$100
156-0905	Santa Fe 4-4-2 Sleeper "Regal Spa"	October \$25

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- Slow, slow speed control that makes precision yard work and smooth coupling possible
- The Power Command 9500 features ammeter and voltmeter to continuously monitor your layout... track, locos and accessories, All of these units run HO, N and other DC scales and are supported by a Five-Year Limited Warranty.

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